

val commences his residence in the hot season, and the skin, with the action of which that of the liver is vicarious, acts freely for a continuance. If he begins his residence in the cold season, he may escape any over-action of the liver altogether; or if it occurs, it will be less in degree, and will be more tractable than in the other case. This increased action is of the nature of functional derangement, and is no doubt attributable to hyperæmia of the organ. This causes at first increased secretion simply, with sympathetic functional derangement of the stomach, and probably of the skin, lungs, &c. If this be speedily checked, and everything is favourable as regards season, and non-malarious condition of the atmosphere, &c., things will return to their original state; otherwise, structural degeneration may occur; but more often than that, there remains a functional derangement of the liver, involving changes of other functions; particularly those with which the liver sympathizes; alteration of the constitution of the blood, &c. The derangement is often of such a serious nature, that a proper acclimatization in India is rendered impossible, and change of climate of some kind becomes necessary. In milder cases, the over-action of the liver is succeeded by a corresponding torpor; and this again, while the constitution retains its vigour, by a fit of over-excitement; these opposite conditions alternating for some time. Consequently, there is always an irregular and vitiated state of the biliary secretion, with its necessary concomitants, impairment of the nutritive and nervous functions of the body generally. This state of hyperæmia of the liver, although produced in the first instance by increased temperature, is kept up very often by local influences, such as produce malaria. In fact, it exists to a greater extent in comparatively cool weather, as in the rainy and cold seasons in India, than in the hottest. In few cases, however, would the exciting cause act, but for the predisposition caused by the increased temperature. Again, in addition to heat, it seems that there must be some influence which arrests the action of the skin, for it has been remarked that in seasons in which the heat has been great, but without moisture, and consequently in which there has been no impediment to a very free action of the skin, there has been an unusual freedom from congested livers. There is no doubt, however, that long-continued heat, even if dry, will of itself, under certain circumstances, produce a state of hyperæmia.

Acute hyperæmia, or inflammation, often, according to the nature of the exciting causes of disease applied, leads to structural changes, abscess, fatty and other degenerations, &c.; with these may be conjoined the effects of fevers, dysentery, dangerous affections of the kidneys, spleen, &c. Sometimes, there is a protracted condition of chronic hyperæmia, which is too often known only by its effects. The patient experiences nothing perhaps but a general feeling of discomfort, and a state of torpor of the mind and of the functions of the nervous system, and of the principal organs, while organic changes are taking place, which will often be found to be irremediable. Frequently the disease commences in a state of sub-acute hyperæmia, in which there is pain, but not of a severe character, little disturbance of the stomach, only torpor of the chylopoietic functions, with some degree of pyrexia; and this state may merge, according to the nature of any reapplied exciting cause, such as errors in diet, the influence of heat or cold, or wet, or any combinations of these on the patient's peculiar constitution, whether irritable or torpid, into an acute or chronic state of inflammation or hyperæmia. The final results are increase of volume of the liver, sometimes to an enormous extent, or hepatic abscess or exhausting diseases of the bowels; the only chance for saving life being an early change of air, the removal of a European to his native, or at any rate, a milder climate, being, with some exceptions, the most likely means to lead to a restoration of health."

42. *Action of Water on Lead.*—Dr. B. W. RICHARDSON makes (*Med. Times and Gazette*, Oct. 29, 1864) some very interesting and important remarks on this subject. He observes:—

"Until recently the popular creed, professional as well as public, on this subject has been that—



"1. Pure or soft waters alone act<sup>1</sup> on lead, and do so in proportion to their purity or softness.

"2. A minute proportion of certain neutral salts in water prevents its action on lead.

"3. Hence hard or impure waters do not act on lead, and may be safely stored in leaden cisterns and conveyed through leaden pipes.

"In 1858, however, Dr. Lauder Lindsay, of Perth, laid before the British Association<sup>2</sup> the records of a series of experiments and observations made by him on this important subject during the previous year. His main or general results were tabulated in the following series of propositions,<sup>3</sup> viz., that—

"1. Under certain circumstances pure or soft waters *do not* act on lead.

"This was well illustrated by the results of the inquiry instituted in 1854–5 by the Town Council of Glasgow, in connection with the proposed water supply to that city from Loch Katrine. This inquiry cost £5000, and was of the most extensive kind and exhaustive character. It proved *inter alia* that Loch Katrine and other equally pure or soft waters (containing under 2 or 2½ grs. per gallon of solid matter, with a hardness of 0.6 to 0.8 of Clarke's scale) exerted, under given circumstance, no deleterious action on lead.<sup>4</sup>

"2. Hard or impure waters, sometimes containing abundance of the very salts which are generally supposed to be most preservative or protective, *do act* on lead, and with the same rapidity and efficiency as pure or soft waters. This was illustrated by the destruction of lead cisterns, through the erosive action of hard water, in the Murray Royal Institution (an hospital or retreat for the insane of the middle classes), near Perth, of which Dr. Lindsay is the physician. This early destruction of lead first directed his attention to the subject.<sup>5</sup>

"3. We are in possession of no satisfactory information anent the causes of the varying action, under different circumstances, of waters on lead; information, that is, which is of any practical use in assisting either in predicating or preventing lead-erosion or lead-contamination.

"4. *Experimentation on the small scale*, and for short periods, is most fallacious, and frequently dangerous in regard to the practical conclusions thence to be drawn.

"5. Contamination of water, both hard and soft, impure and pure, by lead is, in all parts of the kingdom, and under every variety of circumstances, the cause or source of various obscure diseases of man (and also, doubtless, of the lower animals), of the nature especially of dyspepsia and colic. This proposition was abundantly proved by cases of minor diseases induced by lead-contamination of various of the hard or impure waters of London.

"6. So uncertain is the action of water on lead, so impossible is it to predicate the nature or extent of that action under the varying mechanical and chemical conditions of water supply of houses and towns, so difficult is it to prevent the possible dangers, so numerous and excellent are the substitutes<sup>6</sup> that may be

<sup>1</sup> When not otherwise specially explained, this action on lead refers only to that which, by virtue of its nature or extent, renders drinking or cooking waters dangerous or deleterious to men.

<sup>2</sup> Chemical Section—Leeds Meeting, September 24, 1858.

<sup>3</sup> These will be found given in his paper "On the Action of Hard Waters upon Lead," in the *Edinburgh New Philosophical Journal* for April, 1859.

<sup>4</sup> Papers on the "Glasgow Water Works," read before the Institution of Engineers in Scotland, Session 1863–4, by Jas. M. Gole, C.E., and Engineer to the said Works. Glasgow, 1864. p. 22.

<sup>5</sup> *Vide* the published Medical Reports of said Institution for the years 1859 (p. 36) and 1860 (p. 14).

<sup>6</sup> The substitutes in question are of very various kinds. Those most commonly used seem to be—for piping—iron or lead tubes, protected by various innocuous compositions, metallic or otherwise. In the great brewing establishment of Messrs. Allsopp & Sons, at Burton-on-Trent, enamelled pipes have been laid throughout their premises. These are iron tubes, enamelled under the patents of Mr. Paris. The enamel, or fused glass, is applied both externally and internally, so that the iron is completely encased; it is incorporated with the metal while it is nearly at



provided for lead in the construction of cisterns and pipes, that it is desirable henceforth to *abolish the use of lead as a material for the conveyance or storage of water.*

"This *practical* proposition, to which all the others converge or lead, is now being adopted and acted upon by all our most competent and eminent authorities.

"The Royal Victoria Military Hospital at Netley, which ought to be the embodiment of all modern progress and discovery in sanitary science and hygiene in their applications to the construction of human dwellings, uses *no lead* in its water cisterns or pipes. A writer in *Good Words*<sup>1</sup> says of this hospital: 'The *water supply* has been carefully attended to, and to prevent the possibility of patients suffering from *lead contamination*, not an atom of that metal has been used in the construction either of the pipes or cisterns. The former are made of block *tin*, and cost £9000. It would be well for the health of the community if in our private houses similar precautions were used.

"The Commissioners in Lunacy for Scotland in their regulations anent the construction of lunatic asylums, remark in regard to water supply:<sup>2</sup> 'It is of the utmost importance that there should be a constant and ample supply of *good water*, of which a careful analysis should be made, with a view to determine the proper materials for pipes and reservoirs, and also in order to ascertain its fitness for the purposes of drinking and washing.' The reporters add: '*Lead is an objectionable material for pipes and reservoirs as adulterating the water.*' Dr. Hassall, the 'Analytical Commissioner' of the *Lancet*, and the author of the well-known standard work on 'Food and its Adulterations,' says: 'From the number of samples of water I have received containing lead, I am induced to believe that that metal is more frequently introduced into the system in this way than is commonly suspected. Indeed, so many well-ascertained cases of *lead poisoning*, arising from the use of water contaminated with it, have occurred, that I am of opinion that the *use of lead for the storage and conveyance of water ought to be entirely discarded*, especially in the cases of small towns and single houses.'<sup>3</sup>

"Again, the late Dr. Dundas Thomson, President of the Metropolitan Association of Medical Officers of Health, who had for many years given, as a chemist, great attention to the subject of water supply, and than whom, on such a subject, there are no more competent authorities, remarks: '*It is impossible too strongly to condemn the use of lead pipes and cisterns. They should never be used for conducting and retaining water for drinking and culinary purposes. It is difficult to understand the origin of the employment of a poisonous metal for domestic use.* But its disuse must depend upon the substitution of the builder or iron pipe fitter for the plumber, who has too long monopolized the manufacture of this noxious form of cistern.'<sup>4</sup>

"The Americans apparently attribute a greater value to this subject than we do, having devoted a goodly volume to the now bulky evidence *pro* and *con*.<sup>5</sup>

"In 1859-60 the great lead and water question was the subject of much public discussion in the columns of the *Times*. The result was a general feeling that the public safety lay in the *abolition of lead in the construction of cisterns and pipes for water supply*—some writers going so far as to recommend a *prohibition by Government* of such use of lead."<sup>6</sup>

a white heat. The same enamel may be applied as a coating for the surface of vessels used for culinary or domestic purposes.—*Builder*, April, 1860.

<sup>1</sup> Article on the Victoria Hospital, *Good Words*, December, 1863, p. 883.

<sup>2</sup> "First Annual Report (1859):" Appendix C., No. 1, section 6, and No. 2, section 30, pp. 115 and 118.

<sup>3</sup> On "Unsuspected Sources of Lead Poisoning," *Lancet*, April 7, 1860.

<sup>4</sup> On the Proper Sources of Waters for Domestic Supply, *Transactions of the National Association for the Promotion of Social Science*, 1862, p. 615.

<sup>5</sup> "Collection of Reports [Condensed] and Opinions of Chemists in regard to the Use of Lead Pipe for Service Pipe in the Distribution of Water for the Supply of Cities." New York. 8vo., cloth, pp. 343, 9s. London: Trübner & Co. 1859.

<sup>6</sup> *Times*, October 1, 1859.



## MEDICAL JURISPRUDENCE AND TOXICOLOGY.

43. *Physiological Actions of Dajaksch, an Arrow-Poison, used in Borneo.*—Dr. PETER M. BRAIDWOOD gives (*Edinburgh Medical Journal*, August, 1864) an account of some very interesting experimental researches as to the action of a new arrow-poison used in Borneo.

The following are his conclusions:—

1. That this arrow-poison, dajaksch, produces death by paralyzing the heart; which is proved further by the fact, that, after ligature of the heart, death results in the same way and in about the same time as after poisoning with dajaksch.

2. That the cessation of the cardiac contractions is brought about through a paralysis of the cardiac ganglia of the sympathetic, exactly as the same is seen on performing Stannius' experiment. In other words, that with this poison we have a much finer means of performing Stannius' experiment than the knife and forceps afford us.

3. Hence, that the ventricle first ceases to contract, because the ganglia situated between it and the auricles, and which for the most part supply the ventricular sympathetic nerves, are first paralyzed. Then that the auricles become motionless after the ganglia supplying them (the ganglion of the sinus venosus in frogs) are paralyzed.

4. That the other general phenomena produced by this poison, as paralysis of general sensation and motion, etc., may be considered as the natural results of the paralysis of the heart.

44. *Poisoning by Chloroform.*—Dr. MACKER related the following case to the Medical Society of the Haut Rhin. A soldier, aged 27, on furlough, and in a state of drunkenness for several days past, seeing a bottle on a table, which he thought contained alcohol, drank off its contents, which consisted in fact of 12½ drachms of chloroform. He was found soon after vomiting, and soon became insensible, still continuing to discharge mucosities. The pupils were enormously dilated, and his aspect was cadaveric; the respiration was stertorous, the pulse 100, and feeble, and the action of the heart occasionally tumultuous. There were present utter loss of consciousness, complete resolution of the limbs, and absolute general anæsthesia. After a short period the pulse became insensible, the respiration was arrested every now and then, and there was tracheal *râle*. Stimuli to the surface and artificial respiration were resorted to, and strong coffee infusion was injected. This alarming condition continued three hours, the anæsthesia remaining complete and the pupils dilated, while occasional contraction of the limbs was observed. An hour later, however, the pulse rallied, and the skin became warmer, but anæsthesia still persisted. At the end of the sixth hour, the amelioration was very manifest, and in another hour he was carried to the hospital. He retained no memory of what had passed, and neither convulsions nor delirium ensued; and next day he complained of little but what might be due to his excess in drinking.—*Med. Times and Gaz.*, Nov. 5, 1864, from *Union Méd.*, No. 127.

45. *Poisoning by Tobacco-leaves externally applied.*—M. BERNARD related to the Academy of Sciences on July 11th, on behalf of M. Namias, the case of a man who some months before enveloped his whole skin in tobacco-leaf, for the purpose of evading the payment of duty. The tobacco, softened by the perspiration, produced true poisoning. Under the use of alcohol and laudanum, the patient recovered. He had an extremely weak, small pulse, cold sweats, and general prostration, during the time he was under the influence of the poison. M. Namias thought there was no other case on record in which poisoning by tobacco has occurred through absorption by the skin.

At a subsequent meeting of the Academy, as bearing upon the above communication, M. Gallavardin sent in a paper, in which he adduced several cases of poisoning by the external application of the leaves of tobacco. He reports



*Effects of Cold on Milk.*—The effects of a low temperature on milk have been carefully examined by M. EUG. TISSERAND, who recently communicated his observations to the Académie des Sciences. He found that, if cows' milk is immediately, or soon after being drawn, placed in vessels at various temperatures between freezing-point and 90° F., and the initial temperature is maintained for twenty-four or thirty-six hours, it will be found that the nearer the temperature of the milk is to freezing-point the more rapid is the collection of cream, the more considerable is the quantity of cream, the amount of butter is greater, and the skimmed milk, the butter, and the cheese are of better quality. These facts, he believes, may be explained by Pasteur's observations on ferments and their effect on the media in which they live. It is probable that the refrigeration arrests the evolution of the living organisms which set up fermentation, and hinders the changes which are due to their growth. The facts stated indicate room for great improvement in the methods of storage and preservation of milk. To



escaping by the mouth, was forced up the posterior nares, and there took up its abode until its forced removal. It need hardly be said that from that day forth the patient's condition rapidly improved, and she left the hospital a week after the operation with her nose as well as if nothing had happened to it.—*Med. Times and Gaz.*, Feb. 12, 1876.

[An analogous case, in which a glass button with a brass wire eye was removed from the nostril of a lady, where it had remained for upwards of twenty years without its presence being suspected, was reported to the Philadelphia College of Physicians in 1857 by Dr. Isaac Hays, and is published in the Transactions, vol. iii. N. S. p. 154.]

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*Eucalyptus Globulus in Pulmonary Gangrene.*—Of all the drugs employed by Dr. BUCQUOY (of Cochin Hospital, Paris) in pulmonary gangrene, none, he asserts, have given him better results than *Eucalyptus globulus*. He uses it in the form of an alcoholate—two grammes—(half a drachm) daily in a mixture of water, gum, orange-flower water, and syrup. Out of the various cases he has



keep milk at its original quality extreme cleanliness and a low temperature are absolutely necessary. In the north of Europe, Denmark, etc., the value of cold is already recognized, and in warmer climates the need for its assistance is greater. There is nothing impracticable in the suggestion, since running streams can be used to aid refrigeration. Where the quality of the milk is of great importance, ice may be employed.—*Lancet*, March 11, 1876.



sonal ambition for wifely devotion, it has cut at the root of all the charms and virtues of womanhood."—*Med. Times and Gaz.*, May 13, 1876.

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*The Royal College of Surgeons of England.*—This Institution has lately placed upon its examiners in midwifery a very ungracious task, the effect of which would be that the examinations in midwifery would stand alone, and place partially level with those who



TABLE showing

the Elevation above the Level of the Sea, the Mean Annual Temperature, and the Average Amount of Rain Fall at various places in the United States.

(From Prof. GUYOT's *Physical Geography*.)

| Place of Observation.                        | Elevation<br>above the level<br>of the sea,<br>in feet. | Mean temperature in<br>degrees of Fahrenheit's<br>scale. |                             |                 | Average amount<br>of the annual<br>fall of rain<br>in inches. |
|----------------------------------------------|---------------------------------------------------------|----------------------------------------------------------|-----------------------------|-----------------|---------------------------------------------------------------|
|                                              |                                                         | of the<br>month<br>of Jan'y.                             | of the<br>month<br>of July. | of the<br>year. |                                                               |
| <i>East of Mississippi River.</i>            |                                                         |                                                          |                             |                 |                                                               |
| Fort Kent, Maine.....                        | 575                                                     | 11.1                                                     | 62.5                        | 37              | 36.45                                                         |
| Eastport, Maine.....                         | 40                                                      | 22.4                                                     | 62.3                        | 43              | 40.09                                                         |
| Portland, Maine.....                         | 20                                                      | 22.8                                                     | 68.2                        | 45.2            | 43.63                                                         |
| Hanover, New Hampshire.....                  | 530                                                     | 15.8                                                     | 64.4                        | 40              | 40.32                                                         |
| Concord, New Hampshire.....                  | 374                                                     | 21.2                                                     | 67.1                        | 44.5            | 40.99                                                         |
| Portsmouth, New Hampshire.....               | 50                                                      | 24.9                                                     | 67.1                        | 45.8            | 29.88                                                         |
| Burlington, Vermont.....                     | 346                                                     | 20.5                                                     | 69.9                        | 45              | 34.15                                                         |
| Amherst College, Massachusetts.....          | 267                                                     | 23.7                                                     | 71                          | 46.7            | 43.90                                                         |
| Boston, Massachusetts.....                   | 50                                                      | 27.8                                                     | 71.6                        | 48.9            | 39.40                                                         |
| Nantucket, ".....                            | 30                                                      | 34.9                                                     | 71                          | 50.4            | 41.10                                                         |
| Providence, Rhode Island.....                | 150                                                     | 27.5                                                     | 70.6                        | 47.9            | 41.38                                                         |
| Newport (Fort Adams), Rhode Island.....      | 40                                                      |                                                          |                             | 49.34           | 52.46                                                         |
| New London (Fort Trumbull), Connecticut..... | 23                                                      |                                                          |                             | 49.62           | 45.69                                                         |
| New Haven, Connecticut.....                  | 50                                                      |                                                          |                             | 50.8            | 44.43                                                         |
| Potsdam, St. Lawrence Co., New York.....     | 394                                                     | 18.4                                                     | 68.4                        | 43.6            | 28.63                                                         |
| Sackett's Harbor, New York.....              | 266                                                     |                                                          |                             | 45.1            | 36.73                                                         |
| Fort Niagara, ".....                         | 250                                                     |                                                          |                             | 47.91           | 31.77                                                         |
| Rochester, ".....                            | 500                                                     | 26.9                                                     | 69.9                        | 47              | 32.56                                                         |
| Buffalo, ".....                              | 600                                                     |                                                          |                             | 46.1            | 33.84                                                         |
| Albany, ".....                               | 75                                                      | 24.3                                                     | 72.1                        | 48.2            | 40.52                                                         |
| West Point, ".....                           | 167                                                     | 28.3                                                     | 73.7                        | 50.7            | 47.65                                                         |
| New York City ".....                         | 23                                                      | 30.2                                                     | 74.8                        | 51.7            | 44.59                                                         |
| Mackinac, Michigan.....                      | 728                                                     | 19.4                                                     | 64.5                        | 40.6            | 23.96                                                         |
| Detroit, ".....                              | 562                                                     | 27                                                       | 69.7                        | 47.2            | 30.05                                                         |
| Cleveland, Ohio.....                         | 625                                                     |                                                          |                             | 48.9            | 37.61                                                         |
| Marietta, ".....                             | 630                                                     | 32.6                                                     | 73.5                        | 52.6            | 42.55                                                         |
| Cincinnati, ".....                           | 582                                                     | 30                                                       | 74.5                        | 53.8            | 44.87                                                         |
| Chicago, Illinois.....                       | 591                                                     | 23.6                                                     | 70.8                        | 46.7            | 33                                                            |
| Rock Island, Illinois.....                   | 528                                                     | 22.8                                                     | 76.5                        | 50.3            | 38                                                            |
| Fort Howard, Wisconsin.....                  | 620                                                     | 18.9                                                     | 71.5                        | 44.5            | 34.62                                                         |
| Prairie du Chien, Wisconsin.....             | 642                                                     | 19.4                                                     | 75.3                        | 47.6            | 35                                                            |
| Milwaukee, ".....                            | 591                                                     | 25.2                                                     | 69.8                        | 46.4            | 30.40                                                         |
| St. Paul, Minnesota.....                     | 820                                                     | 13.7                                                     | 73.4                        | 44.6            | 25.82                                                         |
| Logansport, Indiana.....                     | 625                                                     | 15.1                                                     | 72.9                        | 50.9            | 37.34                                                         |
| Louisville, Kentucky.....                    | 450                                                     | 35.8                                                     | 74.6                        | 54.9            | 48.12                                                         |
| Nashville, Tennessee.....                    | 533                                                     | 38.2                                                     | 79.5                        | 58.5            | 52.02                                                         |
| Knoxville, ".....                            | 1,000                                                   | 30.5                                                     | 74.1                        | 55.7            | 39.76                                                         |
| Memphis, ".....                              | 262                                                     | 41.7                                                     | 79.9                        | 60.8            | 45.46                                                         |
| Pittsburg, Pennsylvania.....                 | 850                                                     | 29.1                                                     | 73                          | 50.8            | 47.68                                                         |
| Carlisle, ".....                             | 500                                                     |                                                          |                             | 51.10           | 34.01                                                         |
| Philadelphia, ".....                         | 133                                                     | 32.1                                                     | 74.7                        | 52.7            | 35.55                                                         |
| Baltimore, Maryland.....                     | 30                                                      | 30.9                                                     | 75.2                        | 53.1            | 40.84                                                         |
| Fort Washington, Maryland.....               | 60                                                      | 35.5                                                     | 80                          | 57.8            | 45.02                                                         |
| Washington, District Columbia.....           | 40                                                      | 28.3                                                     | 76.7                        | 55.1            | 41.05                                                         |
| Richmond, Virginia.....                      | 172                                                     | 33.7                                                     | 77.6                        | 56.2            | 38.29                                                         |
| Fortress Monroe, Norfolk, Va.....            | 8                                                       | 36.5                                                     | 78.2                        | 59.9            | 47.04                                                         |
| Chapel Hill, North Carolina.....             | 570                                                     | 41.5                                                     | 78.2                        | 59.7            | 42.71                                                         |
| Smithville, Fort Johnson, North Carolina..   | 20                                                      | 49                                                       | 81.5                        | 65.7            | 46.01                                                         |
| Columbia, South Carolina.....                | 315                                                     |                                                          |                             | 51.7            | 47.17                                                         |
| Charleston, ".....                           | 25                                                      | 48.1                                                     | 80.1                        | 65.9            | 41.92                                                         |



**TABLE** showing  
the Elevation above the Level of the Sea, the Mean Annual Temperature, and the Average  
Amount of Rain Fall at various places in the United States.—*Continued.*

(From Prof. GUYOT's *Physical Geography.*)

| Place of Observation.             | Elevation<br>above the level<br>of the sea,<br>in feet. | Mean temperature in<br>degrees of Fahrenheit's<br>scale. |                             |                 | Average amount<br>of the annual<br>fall of rain<br>in inches. |
|-----------------------------------|---------------------------------------------------------|----------------------------------------------------------|-----------------------------|-----------------|---------------------------------------------------------------|
|                                   |                                                         | of the<br>month<br>of Jan'y.                             | of the<br>month<br>of July. | of the<br>year. |                                                               |
| <i>East of Mississippi River.</i> |                                                         |                                                          |                             |                 |                                                               |
| Augusta, Georgia.....             | 600                                                     | 46.7                                                     | 81.9                        | 64              | 24.20                                                         |
| Savannah, ".....                  | 42                                                      | 54.4                                                     | 81.4                        | 67.4            | 48.32                                                         |
| Huntsville, Alabama.....          | 600                                                     | 42                                                       | 76.4                        | 59.1            | 54.88                                                         |
| Mobile, ".....                    | 30                                                      | 57.6                                                     | 83.7                        | 70.3            | 64.42                                                         |
| Natchez, Mississippi.....         | 264                                                     | 52.3                                                     | 81.3                        | 67.1            | 53.55                                                         |
| Baton Rouge, Louisiana.....       | 41                                                      | 53.5                                                     | 81.8                        | 68.1            | 60.16                                                         |
| New Orleans, ".....               | 20                                                      | 55.3                                                     | 82.9                        | 69.9            | 51.05                                                         |
| St. Augustine, Florida.....       | 8                                                       | 57                                                       | 80.9                        | 69.6            | 43.16                                                         |
| Cedar Keys, ".....                | 35                                                      | 55.6                                                     | 81.3                        | 70.5            | 45.77                                                         |
| Tampa Bay, ".....                 | 20                                                      | 61.5                                                     | 80.7                        | 71.9            | 51                                                            |
| Fort Dallas, ".....               | 20                                                      | 66.4                                                     | 82.1                        | 74.7            | 59.04                                                         |
| Key West, ".....                  | 10                                                      | 69.5                                                     | 82.5                        | 76.4            | 36.23                                                         |
| <i>West of Mississippi River.</i> |                                                         |                                                          |                             |                 |                                                               |
| Pembina, Dakota.....              | 700                                                     |                                                          | 74.4                        |                 | 15                                                            |
| Fort Union, Dakota.....           | 2,022                                                   | 21.3                                                     | 73.6                        |                 | 11                                                            |
| Dubuque, Iowa.....                | 666                                                     | 19.8                                                     | 75.2                        | 49.4            | 33.47                                                         |
| Des Moines, Iowa.....             | 830                                                     | 27.4                                                     | 76.5                        | 49.7            | 23.94                                                         |
| Council Bluffs, Iowa.....         | 1,250                                                   | 19.4                                                     | 75.9                        | 49.3            | 29                                                            |
| Leavenworth, Kansas.....          | 896                                                     | 28                                                       | 76.7                        | 52.8            | 31.74                                                         |
| Fort Atkinson, ".....             | 2,330                                                   | 33.4                                                     | 79.2                        | 54.6            | 23                                                            |
| Saint Louis, Missouri.....        | 481                                                     | 31.4                                                     | 78.2                        | 54.5            | 42.48                                                         |
| Little Rock, Arkansas.....        | 150                                                     | 40                                                       | 80                          | 62.3            | 47                                                            |
| Austin, Texas.....                | 200                                                     | 46.4                                                     | 80.7                        | 66.7            | 30.50                                                         |
| Galveston, Texas.....             |                                                         | 48.1                                                     | 83                          | 69.4            | 42                                                            |
| San Antonio, Texas.....           | 600                                                     |                                                          |                             | 69.25           | 33.77                                                         |
| Denver, Colorado.....             | 5,000                                                   | 32                                                       | 78                          | 48              | 16                                                            |
| Salt Lake City, Utah.....         | 4,320                                                   | 27.1                                                     | 81.5                        |                 | 28.85                                                         |
| Sacramento, California.....       | 82                                                      | 45.3                                                     | 73.9                        | 59.9            | 19.59                                                         |
| San Francisco, ".....             | 130                                                     | 49.6                                                     | 57.9                        | 54.9            | 23.50                                                         |
| Monterey, ".....                  | 140                                                     | 52.2                                                     | 58.5                        | 55.3            | 12.20                                                         |
| Los Angeles, ".....               | 457                                                     | 52.8                                                     | 75                          | 62              | 13                                                            |
| San Diego, ".....                 | 150                                                     | 51.9                                                     | 72.7                        | 62              | 9.16                                                          |
| Santa Fé, New Mexico.....         | 6,846                                                   | 31.4                                                     | 72.6                        | 50.6            | 17                                                            |

# POPULATION OF THE GLOBE.

According to the estimate of BEHM and WAGNER in their standard work "*The Population of the Earth*" (Gotha, 1873) the earth is inhabited by a little over 1391 millions of men, viz.:—

| Parts of the Globe.                         | Square miles. | Estimated<br>Population. | Population<br>to each square<br>mile. |
|---------------------------------------------|---------------|--------------------------|---------------------------------------|
| Europe.....                                 | 3,803,203     | 300,530,000              | 79                                    |
| Asia.....                                   | 17,297,275    | 798,220,000              | 46                                    |
| Africa.....                                 | 11,556,208    | 203,300,000              | 18                                    |
| America.....                                | 15,973,226    | 84,542,000               | 5                                     |
| Australian Continent and Pacific Islands... | 3,325,177     | 4,438,000                | 1                                     |



The following ward plan (Fig. 17), with the latrine arrangements in the new summer hospital at the Charité, at Berlin, we give here as an example of the worst possible construction. The general latrines are placed in the corridor, whilst smaller ones are also placed in each of the wards. The wards, corridor, and water-closets all open into each other—the best possible arrangement for preserving a uniform hospital atmosphere, and the worst arrangement for an hospital.

Our space will not permit us to discuss the vexed questions relative to ventilation. We could take up as much space with this topic as has been devoted to this article. If the subject of ventilation is a difficult one as regards buildings in general, it is greatly more so in regard to hospitals. The emanations from sick people are given off in increased abundance, and with increased rapidity, compared with those from the healthy, so that the air of a ward is vitiated with much greater rapidity when filled with sick, than if it were filled with the same number of healthy people. It is still more excessively vitiated if all the sick are fever cases—if the hospital is a fever hospital. Many gases, we know, are also diffused with great rapidity, as when liberated from decaying animal substances and fermenting organic matter, by chemical decompositions of various kinds. The diffusion of these gases takes place with a rapidity proportioned to the square roots of their densities; and no artificial cements will prevent such diffusion. Many gases also pass through fluids and so-called solids. Hydrogen gas and its compounds easily pass through the pores of stucco; so that plastered walls and ceilings are no barrier to the diffusion of cesspool emanations. Hence the intolerable and incurable nuisance of them. Latrines therefore, as generators of this gas, ought not to be placed in contact with hospital wards.\*

It has been supposed, therefore, that as the rate of diffusion of gases is fixed and certain, the process of ventilation, or changing of the air, of a ward ought to go on slowly—at a rate of change, for example, equal to one vertical foot per minute. That is, in a room fifteen feet high the whole air should not be changed at a greater rate than once in fifteen minutes. Such a rate in a sick ward is equivalent to absolute stagnation. The French hospitals contracted for a supply of 2220 cubic feet of air per bed per hour; but

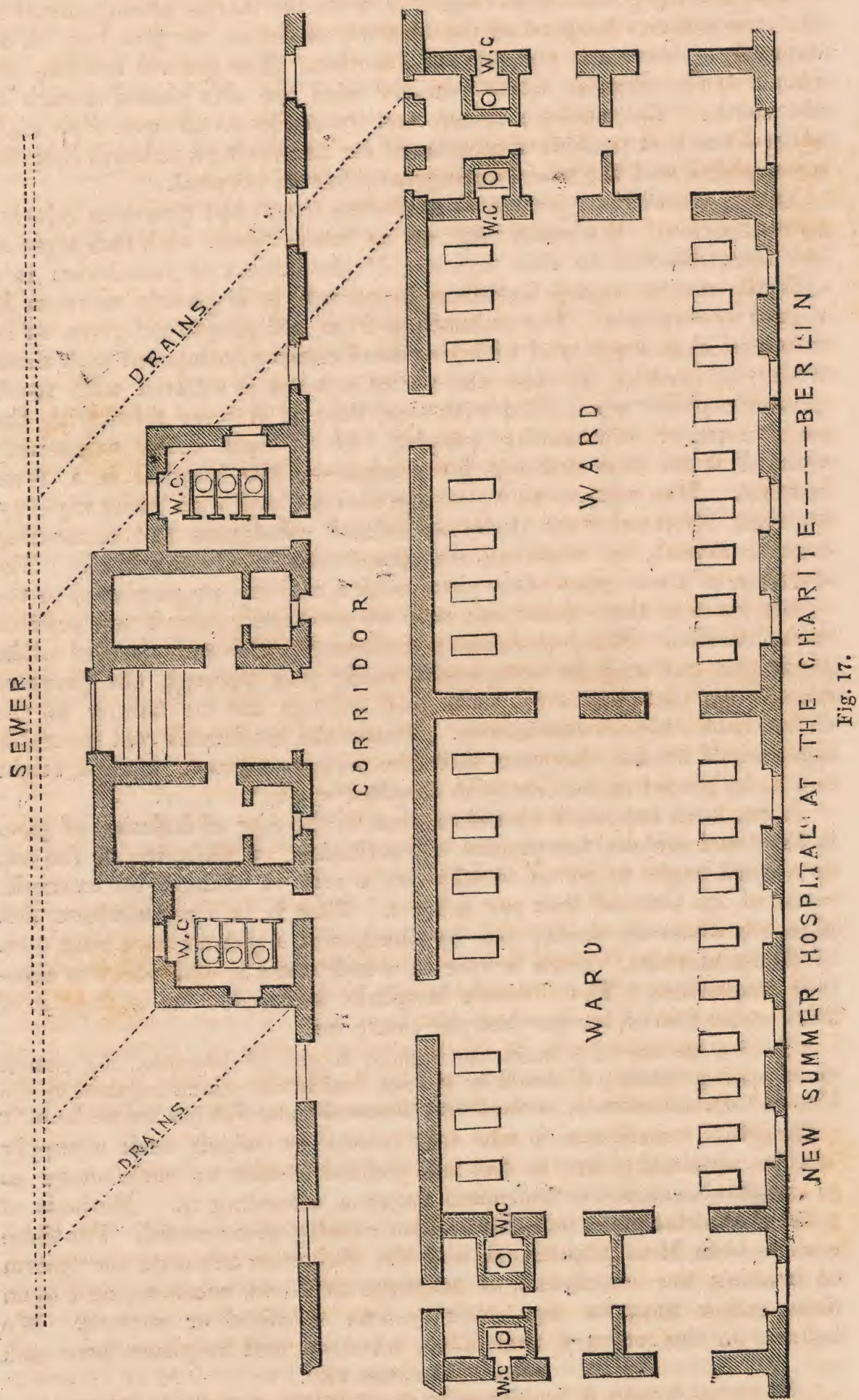
“To give the air of a ward the highest degree of freshness, the amount of air passing through it should be at least double the amount required by the French hospital contracts, or about four thousand cubic feet per bed per hour.”†

*Artificial* ventilation is the only mode by which such a supply can be obtained; but it has not yielded results so satisfactory as to counterbalance the enormous expense attending it. Methods of *natural* ventilation have hitherto been equally unsuccessful. For these reasons both Miss Nightingale and Mr. Robertson advocate the system of trusting the ventilation of hospitals to doors, windows, and open fires, rather than to any other system, *artificial* or *natural*. We believe, on the contrary, that doors, windows, and fireplaces have each

\* The Builder, Sept. 1857.

† On Artificial Systems of Ventilation, by Dr. Sutherland, appendix to Sanitary Commission, p. 457.







## WOMAN'S BEAUTY:—HOW TO GET AND KEEP IT.

THE philosophers have puzzled their wits in vain to make out a satisfactory definition of beauty. Though it seems impossible to describe, we all recognize and admire when we see it. It is not difficult to analyze the combination of material parts which compose a beautiful object; but there is a superadded charm or grace that is every thing and yet nothing, which eludes all attempts to fix in words. This is especially true of female beauty. There are, however, certain material elements which, if not sufficient in themselves to constitute, are essential to it. These we can describe with the utmost precision. Female beauty, thus considered entirely in a corporeal sense, may be defined as a harmonious combination of all the perfections of detail of which the different parts of the human body are capable. The chief elements are a just proportion between the whole and its parts, a sufficient fullness to give the figure a gentle undulation of outline, regular features, a proper disposition of the limbs, delicate hands and feet, a fine and transparent skin, with a warm blush of color over all.

These are qualities highly prized by every woman, and irresistible in their influence upon all men. Nature in endowing the human female with those attractions of which she is the happy and proud possessor, has given her, it might be said, a special sense for the comprehension of, and a fondness for, all that pertains to the cultivation of her beauty. She instinctively devotes herself to her toilet, with an intelligence, an assiduity, and a passion even, that does not admit us to doubt of the value of her personal charms. "It is almost a duty for science," gallantly remarks Dr. Cazenave, an eminent French physician, "to encourage this natural disposition of woman, by putting at her service those medical resources whose efficacy and harmlessness have been proved by experience." He has accordingly published a scientific work, *La Décoration Humaine*, in which he gives his advice to women, telling the beautiful what to do and to avoid, in order to preserve their beauty. He attempts even more, and describes what means are to be used to give beauty to those to whom nature has refused it, and to restore it to such as may, by some means or other, have lost it. Guided by the science of so eminent a medical philosopher, there need be no hesitation in disclosing the secrets of the art of human decoration. We have no reason, in these liberal days, to fear any rebukes from that ancient Puritanism which, with a profane want of reverence for God's image, did its utmost to disfigure it. There are no parents now, probably, like a pious New England grandmother of ours, who, sorely grieving at her daughter's possession of a set of magnificent teeth, lest they might make her vain and ungodly, had the finest of them pulled out.

Every one nowadays admits that it is not

only allowable, but a duty even, to cultivate personal beauty. In fact, in taking care of this we must take care of the health, without which it can not exist.

In ancient, as in modern times, the women spent the greater part of the day at their toilet. The use of cosmetics was greatly in vogue. Aspasia and Cleopatra each wrote a treatise on the subject, and as they were both remarkable exemplars of successful beauty, and of course good authorities, it is a pity that their works no longer exist. The Roman dames were so careful of their complexions that to protect them they wore masks. "These were their home faces that they kept for their husbands," says the satirist Juvenal. The French have been always pre-eminent for their skill in the cosmetic art. Diana of Poitiers kept herself fresh even in old age, by the means disclosed to her by Paracelsus. At the age of sixty-five she was so lovely that the most insensible person could not look upon her without emotion. A bath of rain-water each morning was, it is said, the most effective cause of her wonderful preservation. During the French Revolution, with the greatest affectation of simplicity, there was much artifice of personal adornment. They used washes and pomatums of all kinds, to which luxuries Revolutionary taste was reconciled by such blood-thirsty names as *pommade à la guillotine*, *l'eau de Sanson*, etc.

Under Napoleon the First all the luxurious excesses of the women of the Roman Empire were revived. Madame Tallien bathed herself in a mash of strawberries and raspberries, and had herself rubbed down with sponges dipped in milk and perfumes.

Most of this was an abuse of the art of cultivating personal beauty, and consisted of various absurd practices which had really no effect upon human adornment. There are, however, certain hygienic rules, based upon science, which, if obeyed, will preserve beauty, and if not bestow it, at least take away all the repulsiveness of ugliness.

A pretty face will attract where every other element of physical beauty is wanting. This appeals at once to the heart, while the other parts of the human frame make an impression only upon the senses. We kiss, says a gallant Frenchman, the hand with respect, but we kiss the face with affection. One of the most essential conditions of its beauty is a good complexion. The emotions of the mind have a remarkable effect upon it. It is, as we all know, red, blue, pale, and white, according to the mental impression of the moment. If this impression is often repeated the complexion becomes permanently changed. Hence, to preserve it in its natural beauty the mind must be kept free from frequent and excessive emotion. Extremes of temperature are also unfavorable to the complexion. Persons naturally of a high



and in the unconscious independence which pervades every thing he does and says, you will notice that indefinable assertion of manhood which is the key to the American character. In England you find people of practically a single race—as if America were inhabited by native-born Americans alone—and yet the distinctions of classes are as broad as the gulf described by Lazarus. All are Englishmen, but how different in quality! Many, you are pained to observe, are apparently endeavoring to cease to be men, and are regarded by their superiors as creatures of another species. There are classes of Englishmen whose natural instinct it is to cringe. There are other classes born, like maggots, to grow fat in corrupt corners. You can divide the population into sections; you can number them in classes, like the children of a school; you can see that each man knows himself to be in a groove from which there is no escape, unless he leave the country. With military discipline one caste marches into the prisons, another into the streets, another into the servants' places, another into the trades, another into the shops, another into the wholesale business, another into banking, another into the professions, and another into the aristocracy. Nobody attempts to leave his company to reach a higher position, and every body suits his manners to his station. Money makes very little difference in these castes; cash can not give a man social position in England. The people pride themselves upon their stolidity; they admire their own inertia. If a shop-keeper is conducting the same business in the same place as his grandfather he announces the fact to the world as a matter of congratulation, not seeing that, with his superior advantages, he ought to feel it a disgrace that he has advanced no farther than his ancestors. High and low, all are alike in this. Great names, instead of inspiring their possessors to great deeds, weigh them down like lumps of lead. Call the roll of the House of Peers, and you will hear the brightest titles in history; but attend a sitting of the same House and you will see three or four sleepy old gentlemen presided over by a new Irish lord, whom they secretly despise because his title is so very recent, and respect because he has more talent than all the rest of them put together. Mr. Disraeli has broken through routine by becoming Premier without a title; but this is only one of the exceptions that prove the rule. When French schoolmasters can say to their pupils, "Study hard, and you may yet be Emperor of France, like Napoleon, who was once a poor school-boy such as you;" then English schoolmasters may say to their untitled pupils, "Study hard, and you may yet be Premier, like Mr. Disraeli." The truth is, that Mr. Disraeli became Premier because the older aristocracy has so died out

that there is only one nobleman in the Tory party fit to succeed Lord Derby, and he is Lord Derby's son, whose services are urgently needed as Secretary for Foreign Affairs. The Tory aristocracy being thus exhausted, the leading Tory commoner was sent for by the Queen. Had the Liberals been in power Lord Russell would have made way for Mr. Gladstone for the same reasons. By-and-by Mr. Disraeli and Mr. Gladstone will receive titles, and then all will go on as before, unless the new Reform Bill vitalizes English politics.

So far as I can see, the genuine life of England is now distributed among the lower aristocratic classes and the upper middle classes, and is mainly concentrated on the public press, with which these classes are more or less intimately connected, and through which they speak. The hope, the heart of England is its free press, more powerful and more independent than that of any other country—the United States not excepted—and gaining greater strength and influence every year as it draws to itself all Englishmen who are wise enough not to be satisfied with the present condition of affairs, and bold enough to desire something better. But above and below the classes I have named all is stagnation. The older aristocracy seems to suppose that a handle to one's name elevates him above his fellows; the inferior classes are apparently content to become thieves, servants, costermongers, shopkeepers, or tradespeople, because their fathers were so before them. The hereditary principle affects both the highest and the lowest castes; the struggles and upheavals come from the middle rank. It is with these that Americans who visit England must associate; for although they may be tradesmen themselves, they will instinctively refuse to mingle with the classes here who follow precisely the same occupations, but with incomparably less intelligence and education, and with an incomprehensible vulgarity and servility. It is at once an insult and a lesson to Englishmen of the lower classes that British aristocrats should receive American democrats as equals; and, without inquiry as to their ancestry or antecedents, accept the sons of American mechanics as their honored guests, while the same noblemen would refuse to recognize their own countrymen of similar social position. Nay, more; a poor English couple, to whom all parts of an aristocratic mansion, except the servants' hall, are forever shut, may emigrate to America, and live to see their sons cross the Atlantic and enter the same mansion on terms of perfect equality with its noble proprietor. These truths have their pregnant moral for Englishmen, and thousands of sturdy workers and thinkers have learned that moral well in long and bitter years of painful experiences.



color bear cold best, and the pale and dark heat best.

The food and drink have a very decided influence. Excess of either will give, particularly to the high-colored, a coarse ruddiness of complexion, which reveals at once the gross cause. A too meagre nourishment is no less unfavorable, and shows its impoverishment in a pinched face and colorless complexion. Hear what Brillat Savarin says: "*Gourmandise* is favorable to beauty. A train of exact and rigid observations has demonstrated that a succulent, delicate, and careful regimen repels to a distance, and for a length of time, the external appearance of old age. It gives more brilliancy to the eyes, more freshness to the skin, more support to the muscles; and as it is certain in physiology that it is the depression of the muscles which causes wrinkles, those formidable enemies of beauty, it is equally true to say that, *cæteris paribus*, those who understand eating are comparatively ten years younger than those who are strangers to this science."

This is the cause of the pale, pasty complexion of many of our dames who are otherwise so charming. *They do not understand eating.* Not but that they put enough into their stomachs, but what they do fill them with is not of the right sort. Instead of feeding at regular periods upon well-cooked, nutritious food, they waste their appetites upon cakes, sweets, and other indigestible articles. Nothing is more fatal to purity of complexion. Every bit of pastry eaten seems to rise from the stomach to the face, and shows itself there as distinctly as if in the confectioner's shop-window. The diet too must be regulated according to the natural complexion of the individual. The excessively ruddy should feed lightly, avoid heating articles of food, and strong wines and liquors. The pale, on the contrary, should live on a more substantial diet, moistened with generous drink. Too much sleep is as hurtful as excessive watchfulness, and over-exercise should be avoided equally with an indolent repose. "*Il y a*," says a French authority, "*certaines personnes qui prennent tous les jours un lavement, pour se conserver, dit-on, le teint frais. Il y a évidemment une exagération dans cette habitude quotidienne, qui d'ailleurs va souvent en grandissant d'une manière déraisonnable; mais au fond, il y a quelque chose de vrai.*"

The obvious means of protecting the complexion from heat and cold is to avoid exposure. If this is inevitable, nothing is better to prevent tanning by the sun, or any of the effects of temperature, than to powder the face when dry with ground starch or rice.

Dr. Cazenave is decidedly opposed to the free application of water to the face. He says: "You should moisten the skin of the visage as little as possible." There are some skins even, according to him, which should never be *cleaned* except with powder, and he exclaims: "How many dames there are who have preserved a delicate, fresh, and transparent complexion by

never, or at least hardly, moistening it!" This is said to be the practice of the Circassian beauty of the Turkish harem. She is as chary of water as a cat, and keeps her face in order solely by dry rubbing. On the other hand, a competent authority in *Harper's Bazar* affirms that one of the most brilliant American complexions he ever saw was due, according to its possessor, to the free use of soap and water.

Greasy applications of all kinds (except in special cases of disease) are bad, and paint of all colors worse. "If women," says La Bruyère, "wish only to be beautiful in their own eyes they may furbish themselves up as they please, but if they wish to please the men they should know that powder and *rouge* make them frightful."

Dr. Cazenave declares that the two favorite remedies, iron and the sea-bath, are "enemies of the complexion." They are useful, however, sometimes, but those who require them must choose between health and beauty. Although we heartily approve of the sly kick the good Vicar of Wakefield gave to his daughters' face washes, overturning them into the fire, there are occasions when certain lotions may be applied to the complexion with advantage.

Of all washes, according to Dr. Cazenave, this is the best:

|                             |           |
|-----------------------------|-----------|
| Bi-chloride of mercury..... | 2 grains. |
| Muriate of ammonia.....     | 2 grains. |
| Emulsion of almonds.....    | 8 ounces. |

Mix and apply with a fine linen or sponge. Sometimes, when the skin is excessively delicate, it may be necessary to dilute the wash with an equal part of water. The face, moreover, can be washed, without any fear of a bad, and with some hope of a good effect, with elder-flower water, weak tea, or emulsion of almonds.

The lotion ought always to be of a *lukewarm* temperature when applied. It should be allowed to remain without wiping, unless powder is used afterward, when the face must be thoroughly dried. The application being made at night, as is most convenient, next morning the powder, if it has been used, must be gently removed, or a bit of fine linen, dipped in water containing a few drops of Cologne, Hungary water, or lavender, passed very lightly over the face.

When the skin of the face is dry, brittle, thick, and pimply, it may be necessary to apply cold cream or *pommade de concombres*. A little of one of these may be spread over the complexion with advantage before exposure to the sun, or to the fresh breeze, such as is met on the sea-shore. Here is the best ointment for pimples:

|                           |            |
|---------------------------|------------|
| Bi-carbonate of soda..... | 36 grains. |
| Glycerine.....            | 1 drachm.  |
| Spermaceti ointment.....  | 1 ounce.   |

It is most convenient, for obvious reasons, to apply the ointments, like the lotions, at night. About a quarter of an hour after their application the face should be wiped in such a manner as to leave but a slight trace of them, which



should be finally removed altogether next morning by means of a little Cologne diluted with water.

In order to preserve the freshness of the complexion there are certain pastes which may be used. They are put on at night, covering the face like a mask, and removed in the morning by washing with chervil water (*eau de cerfeuil*). The best composition for one of these masks, not to conceal, but to generate beauty, is this:

Ground barley..... 3 ounces.  
Honey..... 1 ounce.  
White of egg (one).  
Mix into a thick paste.

A woman's hair to be beautiful must be long and abounding, gently undulating, fine of texture, and of a brilliant surface. As for color, that depends upon taste, or shall we say, fashion? The *blond doré* or golden-yellow hair of the Empress Eugénie has brought the light colors into great vogue, and exalted even the once despised red heads high above the crowd.

The condition of the hair depends much upon the state of the general health. An improper diet and all causes which deteriorate the latter injure the former. Excess of every kind, both mental and bodily, is sure to produce premature grayness or baldness. Rakes, it is said, find it impossible to keep the hair upon their heads. The habit of wearing night-caps, and the hat or any other covering on the head in the house, is fatal. The neglect of the hair, by people otherwise careful of their persons, is a frequent cause of injury. A coarse comb should be constantly used, but a fine one seldom, and the hairs separated over and over again, so that they may be thoroughly exposed to the air. The brush should have bristles long and stiff enough to cleanse thoroughly the scalp and stimulate the bulbs at the root of each hair.

Too much interference, on the other hand, does more harm than even total neglect. There are some women, and particularly those naturally endowed with the most beautiful hair, who carry its care to an excess. They are in the habit of squeezing, twisting, and otherwise tormenting it to such an extent that the skin of the scalp is torn, the hairs broken, and even the bulbs, upon which their growth depends, are permanently injured. The fine comb is generally too much used, particularly where the hair is parted. Here, in consequence, and at the back of the neck, where the hair is so tightly drawn up, the first bald spots show themselves.

The styles of modern hair-dress are generally faulty, as are all those which do not leave the hair to flow almost in its natural freedom, but require a great deal of tight squeezing, close twisting, and curling. The heat of the tongs is sure to dry the hairs, to render them brittle, to burn the skin, and pervert the natural functions of the scalp. That style of hair-dress is the best which admits of the hair being gently raised, requires the least possible squeezing,

and which consists in smoothing carefully and arranging it in wide loose bands, so that it can be easily and always ventilated. If fashion is so exacting as to insist upon obedience, and the hair is accordingly squeezed and knotted tightly, care must be taken to give it repose, by undoing and letting it flow for some time each morning and night.

Wetting the hair is emphatically condemned by Dr. Cazenave. Other good authorities approve of it, with the condition only of its being followed by a thorough drying. The former says it is a bad practice for women to moisten *incessantly* (and this no one can doubt) their hair, in order to give it a momentary smoothness and darkness of color. The doctor, moreover, adds that the cold bath, and especially sea-bathing, is an "enemy of the hair."

Pomatus and artificial applications of all kinds are not required by those whose hair is in a state of perfect health. A comb and a brush are all that are necessary, and nothing else should be used by such. Occasionally, however, the hair becomes unnaturally dry, loses its brilliancy and suppleness, breaks or splits at the slightest touch, and easily entangles. Pomatus are now useful, and the best is this simple one:

Ox marrow..... 1 ounce.  
Oil of bitter almonds..... 2½ drachms.  
Mix.

With this disposition of the hair to split and break it is better not to get it cut until its condition is improved.

The hair often becomes too greasy and moist, from an excess of secretion which is deposited in a crust upon the scalp. This not seldom causes baldness. It is to be remedied by scrupulously avoiding all oils and pomatus, and applying a little powdered starch at night, and carefully brushing it out in the morning. This wash, too, may be employed with advantage:

Water..... 6 ounces.  
Carbonate of soda..... 36 grains.  
Dissolve and add the yolks of two eggs, well beaten.

There is a common but a false notion that frequent cutting of the hair is favorable to its health and growth. Mothers thus often despoil their infants of their first silken locks, with the idea that the second hair will be much more rich and abundant. "This is an error. The most beautiful and abounding heads of hair I ever saw," says Dr. Cazenave, "were those which the scissors had never touched." Mothers, not satisfied with trimming the hair of their children, often have it shaved or cut close to the scalp, when they find it losing some of its brilliancy or falling out. Except in certain rare cases of disease, the total sacrifice of the hair is unnecessary, and the second growth is never equal to the first. Getting the hair trimmed from time to time may be allowed as a matter of convenience, but it does not produce the benefit generally attributed to it.

Baldness, whether produced by age or any other cause, is seldom curable. Women are,



A RECENT writer of the life of Bishop Thirlwall says that "at the age of three he was taught Latin; at four his father, the Rev. Thomas Thirlwall, who was his instructor, reports he read Greek with an ease and fluency which astonished all who heard him; at seven he began to write sermons, and continued the exercise of his powers in that direction for three or four years."



were 107 for the  
the 1867s,  $103\frac{5}{8}$  for the old 5s, and 107 for the  
10-40s. Bar silver was quoted at  $53\frac{1}{2}$ d. The  
rate of discount in the open market for three  
months' bills was  $1\frac{1}{4}$  per cent, which is  $\frac{3}{4}$   
below the Bank rate. The *Times*, in its  
financial article, says it was impossible to  
make short loans at the Stock Exchange on  
Thursday at any price whatever. At Frank-

and U.S. new 5s were quoted at 102



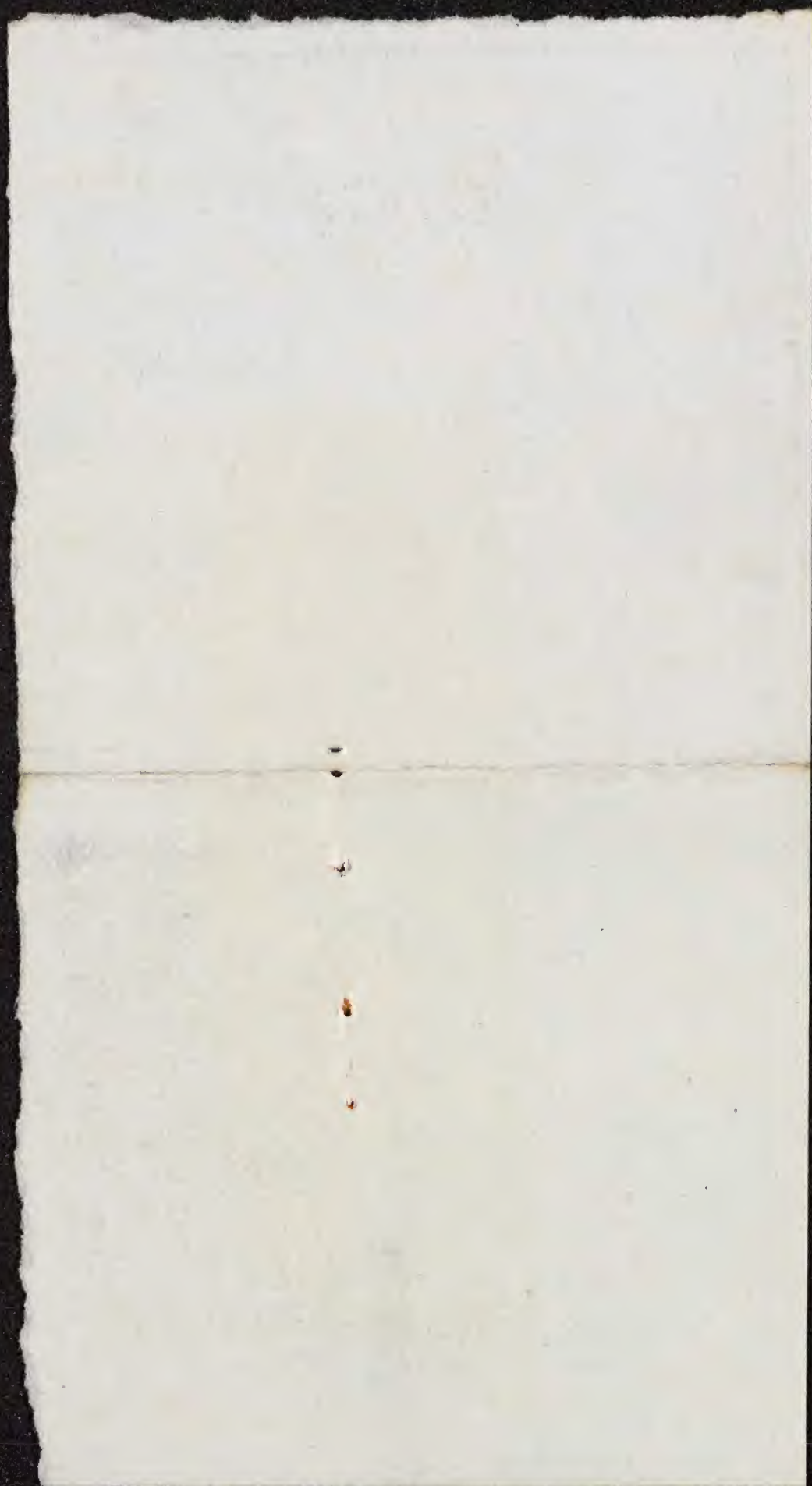
Michael Angelo (at  
15 yrs sculpt, made 70  
Raim) painted Last Judgment  
at 67 — after 50 also  
Sculpt. Moses & built  
Dome of St. Peters.

Poussin, at 71, painted the Deluge  
his last best work.

Mantegna painted his most  
famous pictures betw. 50 &  
64 yrs. Caraffa be-  
came Pope Paul IV at  
the age of 79 years.

over







HAND-BOOK OF PHYSIOLOGY. By WILLIAM STEN-  
HOUSE KIRKES, M.D. Edited by W. MORRANT BAR-  
KER, F.R.C.S., etc. A new American from the eighth  
enlarged English edition. Philadelphia : Henry C. Lea.  
1873.

SIX MONTHS UNDER THE RED CROSS, with the French  
Army. By GEORGE HALSTEAD BAYLAND, M.D. Cin-  
cinnati: Robert Clarke & Co. 1873



THE OLDEST PRACTISING PHYSICIAN.—A correspondent of the *Medical and Surgical Reporter* writes, in answer to a query, that Dr. Ahl, of Baltimore, continued in active practice until he was ninety-six years of age; Dr. Bernardus Van Leer, of Chester Valley, did the same until he was one hundred and two years old. He died at the age of one hundred and four.



It will, perhaps, be urged that there have been many brilliant cases wherein the rules of health were not only violated but outraged, and yet the work performed was of the very highest order. This is undoubtedly true of many men of extraordinary genius, who were, however, exceptional men, in every sense of the word, and hence their example is not to be cited as that which ordinary persons should follow. No one, for instance, should do as the great French novelist Balzac used to. When he was engaged on a novel he would retire wholly from the world to write with scarcely any interruption, and without taking any exercise, from two o'clock in the morning till six in the evening; he allowed himself six hours sleep, and lived entirely on fruit and vegetables. At the end of some months of this life he would enter the world again, looking like a spectre; yet it may be true that it was only by such abnormal work as this he could achieve what he undertook. The vast majority of men would break down under it. Some men cannot do brain work well, except at night. This was the case with Schiller; while his great rival, Goethe, did all his work in the morning, and never wrote after his mid-day dinner. Sir Walter Scott wrote his novels mainly before breakfast, while Byron composed his poems mostly late at night. The contrast between the results of these two opposite systems of labor, is remarkable in these four cases. Goethe and Scott respectively attained the ages of 84 and 61, while Schiller died at 46 and Byron at 36. Moreover Schiller indulged in champagne, and Byron in gin and water, and both habitually wrote under the influence of stimulants. They shortened their lives by their irregular mode of living and working. Would they not have lived longer and accomplished more by observing the laws of health? Goethe worked without stimulants, and Scott, though not averse to wine and ale, was a temperate man, an early riser, and fond of field sports and exercise in the open air. But even he ultimately succumbed to overtension of the brain, in his desperate but honorable efforts to pay off the debts for which he considered himself responsible; had it not been for this unnatural brain-work he might have lived many years longer. Southey, though a diligent student and a constant worker, would never under any circumstances do with less than nine hours' sleep, and he was an abstemious man; accordingly he lived to the age of sixty-eight; he did all his writing by day. The late Archbishop Whately, who lived till nearly eighty, was, however, a remarkable instance to the contrary. He said that he could not produce original matter except at night, but that he could best criticise and correct in the morning. The habit of writing and reading at night may be acquired; and, indeed, it very often is, especially by persons connected with the press, and by others who are called upon by their avocations to do brain-work in the evening, such as actors, lecturers, preachers, and others. Nevertheless there is good reason to believe that all of these would accomplish more by working as much by day as their avocations will permit, and not undertaking too much.



Mr. Farnsworth.

Massachusetts say that the committee authorized him to report back that bill?

Mr. Butler—I am not to be catechised.

Mr. Farnsworth—Every member of the committee knows that we have not considered that bill since it was recommitted, and I ask the clerk of the committee may be summoned up here to decide if it is a question of expediency.

Mr. Butler—This is a very plain matter. The bill was before the committee, was reported to the House, and was ordered to be printed and committed for the purpose of being put upon passage at the earliest possible moment. I am carrying out the instructions of the committee.

The Speaker said he would submit to the House the question whether the report would be adopted as his report of the committee.

Mr. Farnsworth—Then I desire the House to understand the fact that the committee has never authorized it—never.

The yeas and nays were ordered on the question whether the report should be received.

Mr. Johnson moved to adjourn. Lost—yeas 97.

Mr. Butler yielded to Mr. Washburn, of Massachusetts, who introduced a bill giving the Union, Topeka and Santa Fe Railroad Co., continuance of its franchise, right of way through the territories. Referred.

Mr. Stevenson, of Ohio, offered a resolution relating to the Secretary of War for information relative to the late expedition against the Leon Indians. Adopted.

The House then, at 5 P. M., adjourned.

[Correspondence of the Public Ledger.]

#### THINGS IN NEW YORK.

New York, March 3.

The Chamber of Commerce, at their meeting this afternoon, received a report from the committee having the subject of the Alabama claims in charge. It was resolved to submit it to the consideration of a special committee. The committee that had been appointed to consider the removal of the cedar forests on Sandy Hook, by the railroad there, reported that, on investigation, it was found that the timber removed was only enough to allow the road to pass, leaving a width of three-quarters of a mile between the road and the sea, and that the road had been located under the supervision of the United States officers. No further action on the subject is necessary.

The Chamber subsequently listened to an address from Captain John Codman, on the subject of free trade in ships. As things stand at present, he complained that American captains, more of whom are sailing in the British foreign trade than in their own, are obliged by their Government either to give up their profession or their country.

A Convention of the various Congregational Societies is in session to-day, to make arrangements for the commemoration of the hundredth anniversary of the Pilgrim Fathers. As newspaper reporters are excluded the public is in ignorance of what is saying and doing.

Mr. Beecher, Rev. Dr. Storrs, and other prominent clergymen are present.

The joint committee of the Common Council, who had the Seward reception in charge, met this morning, to consult as to what should be done with reference to the Mayor's message, practically forbidding the reception. After a free expression of opinion, it was resolved to lay the whole matter before the Common Council, in an official form, leaving it to that body to determine what, if any, other steps shall be taken.

The schooner *Hickory*, while on the way from Hoboken to the Atlantic Docks, Brooklyn, this morning, with a cargo of pig lead, was captured off Bedloe's Island. The captain and three other men were rescued by the tug *Rattler*, that happily chanced to be near by at the time. The vessel was owned at Hoboken.

The trial of McFarland for the murder of Richardson will probably not commence until the end of the month, owing to the delay in obtaining the testimony of certain important witnesses for the defence.

*Brown - Henderson's message -*



### Oddities of Genius at Work.

Rousseau composed his finest pages while walking the forest of Montmorency.

Voltaire had in his room sometimes five desks, at which he pursued different tasks.

The great romancer, Balzac, after a frugal dinner at six or seven o'clock, was called at midnight, when he took a cup of black-coffee, or green rather, and extremely strong, and worked till noon.

Michelet works in the morning, and uses coffee also. As soon as he rises, at six o'clock, he swallows it. This carries him, he says, till noon.

Turgot never worked but when he had dined heartily.

Pitt never ate but at his own table, which was frugal; only when he had some important affair to discuss he took a little port wine with a spoonful of Peruvian bark.

Addison speaks of an advocate who would never plead a case without having in his hand the end of a thread, drawn tightly around one of his thumbs all the time his speech lasted. The wags say it was the thread of his discourse.

Dr. Shapman relates that a celebrated advocate of London always applied a blister to his arm whenever he had an important case to plead.

Girodet never loved to work during the day. At night, when inspiration came to him, he arose, lighted candles, and, half muffled up, painted his great diluvial *cabars*.

Michael Angelo did nearly the same, but with a single candle; and for statuary the effect is very different.

The historian, Mezeray, would work only with a candle, even at midday and at midsummer. He never failed to wait on his visitors, even to the street, with a candle in his hand.

Gretry, to animate himself when composing, breakfasted and took coffee, and then applied himself day and night to his piano.

Bossuet worked in a cold room with his head warmly enveloped.

It is said that Schiller, before composing, put his feet in cold water.

Guido Reni painted with much pomp. He dressed himself magnificently, and had his pupils attend him in silence ranged around him.

Sarti, the musician, composed only in darkness.

Cimarosa, by way of stimulation, sought light and noise.

Paisiello had to bury himself up in his bed-clothes to become inspired.

Variety in work is the secret of its harmlessness. "To know how to rest," says the hygienist. "To be able to rest," replies the poet, the artist, the writer.

Michael Angelo, Leonard de Vinci, Titian, Rubens, passed from the chisel to the pen or the brush. The change rested them from the preceding work; and thus, during long life, they accomplished marvellous works.

Some persons can think only standing, or in walking the room with swift strides. Some, like Montesquieu, compose in a post chaise. One has need of complete isolation, profound calm; another of the open air and the noise of the crowd.

The atelier of Delacroix was a veritable hot-house.

Buffon wrote in lace ruffles; Alexander Dumas in his shirt sleeves.

Houssaye works only in the daytime and in his great picture gallery. There, with life and bustle all about him, Houssaye dictates to four secretaries on various subjects—to this one a romance, to that one a critical feuilleton, to another some political notes, and to still another a page of "The History of the Eighteenth Century."

Theophile Gautier wrote, or rather designed his feuilleton of ten columns upon a big square of paper.

Milton composed his "Paradise Lost" on a large arm chair, with his head thrown back.

When Fox had eaten heartily he would retire to his study, envelope his head in a napkin soaked in vinegar and water, and work sometimes ten hours in succession.

Mathurin, the author of "Bertram" and "Melmoth," withdrew from the world in order to compose. When the inspiration seized him he placed a wafer between his eyebrows, and his domestics, warned by this signal, would keep their distance.

Jeremy Bentham jotted his ideas on little squares of paper, which he piled upon each other, and this pile of little papers stitched together, was the first forms of his manuscripts.

Napoleon had his particular mode of meditation and work. When he was not in council, says Bourrienne, he staid in his study, talked to himself and sung, or, like a child, cut the arms of his chair; then suddenly rousing up, would give the plan of a monument to be erected, or dictate those immense movements which astonished the world.



# LOCAL AFFAIRS.

PHILADELPHIA COUNTY PRISON—INTERESTING STATISTICS.—The whole number of persons committed to the County Prison in the year 1873 was 19,827, while the discharges in the same period amounted to 19,983. The annexed table shows the commitments and discharges of each month of the year, with the sex and color of the prisoners:

|              | White Males. | White Females. | Black Males. | Black Females. | Total. | Disch'd. |
|--------------|--------------|----------------|--------------|----------------|--------|----------|
| January..... | 1175         | 230            | 54           | 27             | 1516   | 1495     |
| February.... | 1013         | 214            | 42           | 27             | 1308   | 1397     |
| March.....   | 1270         | 285            | 47           | 35             | 1633   | 1609     |
| April.....   | 1413         | 315            | 64           | 45             | 1827   | 1810     |
| May.....     | 1237         | 232            | 76           | 40             | 1694   | 1751     |
| June.....    | 1303         | 237            | 63           | 38             | 1631   | 1609     |
| July.....    | 1485         | 285            | 48           | 40             | 1858   | 1783     |
| August.....  | 1436         | 360            | 58           | 41             | 1945   | 1875     |
| September..  | 1357         | 368            | 58           | 34             | 1761   | 1873     |
| October..... | 1273         | 211            | 78           | 23             | 1543   | 1601     |
| November..   | 1261         | 202            | 72           | 29             | 1554   | 1491     |
| December..   | 1253         | 210            | 77           | 22             | 1562   | 1589     |
|              | 15,381       | 3130           | 717          | 393            | 19,827 | 19,983   |

In the year 1872 the total number of commitments was 19,582, with 245 of the number of last year. The totals of both years, as shown, will show how nearly the commitments compare as to the number of each sex and color:

|           | W. M.  | W. F. | B. M. | B. F. | TOT.   | DIS.   |
|-----------|--------|-------|-------|-------|--------|--------|
| 1872..... | 15,171 | 3409  | 653   | 349   | 19,582 | 19,540 |
| 1873..... | 15,381 | 3130  | 717   | 393   | 19,827 | 19,983 |

From these figures it will be seen that the prison is equally as crowded as it was last year, when on the convict side many of the cells contained three and even four prisoners. Mr. Perkins, the Superintendent, remarks that great difficulty is experienced in maintaining proper discipline among the convicts, owing to the crowded condition of the cells. Frequent conflicts take place among those from necessity kept together, and increased accommodation is regarded as one of the things most imperatively required, as the House of Correction will not accommodate the convict side of the Prison of any other inmates.

When the County Prison was first used Philadelphia had scarcely half the population it now has, and no enlargement has been made of the male department, though the female has been increased by the addition of the building in which insolvent debtors were formerly confined. With its crowded condition the Prison is kept clean and well-ventilated, and to that fact is attributed the general good health of the inmates.

The following gives the names, color, date of sentence, and the disposition of the persons committed on the charge of murder since the date of the opening of the prison in the summer of 1872, the record not yet being completed:

Henry Moore, black, May 7th, 1839. Died Jan. 28th, 1840.  
 James Morris, black, Nov. 11th, 1840. Executed Jan. 15th, 1841.  
 Sarah Ann Coleman, white, May 8th, 1841. Executed Jan. 15th, 1845.  
 Thomas Shuster, white, May 8th, 1841. Executed May 19th, 1842.  
 Thomas Fitzpatrick, white, Dec. 6th, 1843. Executed Jan. 15th, 1844.  
 Alexander Welding, black, April 6th, 1844. Executed Oct. 10th, 1845.  
 Gottlieb Williams, white, April 6th, 1844. Executed Nov. 7th, 1844.  
 Samuel Zeppen, black, Jan. 8th, 1844. Executed April 18th, 1845.  
 Carl Pappenberg, white, May 5th, 1846. Executed July 29th, 1849.  
 Charles Mosler, white, Nov. 27th, 1846. Executed April 23d, 1847.  
 Adget Harman, white, Nov. 27th, 1846. Executed June 25th, 1852.  
 Samuel Emmons, white, July 26th, 1847. Executed Sept. 25th, 1847.  
 George Murphy, white, July 26th, 1847. Executed Sept. 25th, 1847.  
 Charles Langfeldt, white, May 23d, 1848. Executed Oct. 20th, 1848.  
 Edward Ford, black, May 31st, 1851. In prison.  
 Nicholas Harris, white, Jan. 8th, 1852. Executed Jan. 10th, 1852.  
 Matthias Skupinski, white, April 2d, 1852. Executed Aug. 6th, 1852.  
 Joseph Skupinski, white, April 2d, 1852. Executed Dec. 3d, 1852.  
 John Spring, white, April 16, 1853. Executed June 10th, 1853.  
 John Emmons, white, June 29th, 1853. Executed Dec. 15th, 1855.

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### INCREASE OF PARALYSIS.

It will probably be nothing new to our readers to say that a wide and anxious interest exists all through the country, and especially the Middle States, from the marked and steady increase of paralysis, apoplexy, and the various forms of brain and nervous diseases. The Springfield Republican says: "Vice President Wilson has passed into that stage of health which Mr. Chase so long occupied—a paralytic invalid, to whom life is of most uncertain duration." On which the Washington Evening Star comments as follows:

"We noted some time ago the alarming fact that so many prominent men were being stricken down with paralysis, and the case of Vice President Wilson adds another to the long list then presented, which embraced the names of Chief Justice Chase, Senator Morton, Mr. Colfax, Senator Brownlow, Walt Whitman, Horace Greeley, &c. The cases of prominent public men attract more attention, but physicians say that paralysis is notably on the increase amongst all classes of the American people. The question rises if it is getting to be a national disease; and if so, the cause of it.

"In France, or Paris, where paralysis is getting to be a familiar disease, the cause has been attributed to a life of over-excitement, the use of absynthe, &c. But, it will be noticed that the larger number of our paralytics are of temperate and comparatively unruffled lives. Mr. Colfax has always been of temperate habits, and, at the time of his attack, nothing had happened to disturb the sunny tenor of his life; the Mobilier troubles and excitements having come upon him later. Senator Wilson is of temperate, regular habits, and his appearance has always indicated high health and buoyant spirits. Walt Whitman, a philosopher, in mental and physical habits abstemious, slow in speech, gait, and life generally—the picture of rosy, sturdy health—he, too, is stricken down in a moment from his superb manhood."

Willing to aid in calling attention to the enormous increase of paralysis, we cannot agree with the "no special reason" theory referred to by the Washington Star. The truth is, of course, that the cases of all those persons, in private or public station, "singled out" in the midst of apparent health for sudden attack, are generally the results of a series of violations or persistent neglect of physiological laws. Chief Justice Chase was peremptorily warned some years since, by his physician, to relieve himself from all strain upon his physical and mental energies, and was told he was "like an old carriage that could go for many a year yet, with care, upon a smooth road, but would soon be destroyed on a rough one." Vice President Wilson, for four or five months before the last Presidential election, subjected himself, without intermission, mentally and physically, to a rate of speed and change and a degree of pressure which has since had to be paid for, as was to be expected. Walt Whitman, disregarding medical caution, continued yielding his iron physique, month after month, to the subtlest malaria of the Army Hospitals years ago, and to-day he is paying the penalty. Horace Greeley lived such a life that, for fifteen years before his death, it is believed that he did not know what it was to have a good night's sleep.

The significant lesson taught by all the instances mentioned is that a while afterward, sometimes months, sometimes even years, the stern penalty will be exacted—that good intentions and high ambition or endeavor do not excuse lapses of the indisputable laws of health, and that being borne through for the time by reserved force, maturity or a strong will, may prove but a sad delusion.

The subject needs volumes for its due elucidation; but enough is above stated to rouse the reader to give it—what it most needs—thought for his or her own case.



# DR.

EN CENTS PER WEEK.

prisoners were arrested south of the new boundary line, on American soil. This will work new complications, although it cannot be yet surmised just what effect the discovery will have on the future proceedings."

ST. PAUL, July 13.—Gov. Austin addressed a letter to United States Consul Taylor, of Manitoba, in which he says: I have noticed with deep satisfaction the manly and independent course which you have taken in defence of the rights of the prisoners. They are American citizens, and as such entitled, guilty or innocent, to the privileges referred to, and I am glad the United States has a representative on the ground who comprehends the rights and dignity of American citizens.

I trust you will not be intimidated in your defence of those principles, but will boldly defend the prisoners in all their lawful privileges, entering a fearless protest against every outrage that is offered either to their person or their civil rights.

The officers effecting Gordon's arrest clearly acted in the full belief that they had a perfect right to arrest and remove him in the manner undertaken, and it is by no means certain that they had not that right. Should the prisoners be held to answer, and especially if refused bail, I think it a case that should be laid immediately and specifically before our Government.

I am aware that it is not my province to instruct or direct your course, but I have no doubt you will be fully and cheerfully sustained by the Government at Washington in acting up to special suggestions. I speak only as a citizen of the United States and as representative of the Executive authority of the State of which the prisoners are citizens, and which will not fail to do all in its power to protect the humblest of its people against outrage.

## Destructive Fire.

GRAND RAPIDS, Mich., July 13.—At three o'clock to-day, this city was visited with another devastating fire. It was first discovered in an alley near Bridge street. A house and barn located on Kent street took fire, and, being very dry, and a high wind blowing, within a very few minutes was one sheet of flame.

Notwithstanding the firemen were early on the ground and at work, the flames soon got beyond their control and spread in all directions, consuming everything in its way from Bridge street, up to Trowbridge and from Canal to Division, except buildings fronting south on Bridge street and west on Canal street. A. Gay's furniture warehouse; Rice & Tease's flouring mills and two or three adjoining buildings on the south, and a quantity of lumber on a lot next to the Ohio House, were all that was burned on Canal street. About twenty acres of ground were burned over, and two hundred buildings consumed.

The loss cannot be less than \$300,000. It is impossible, at this time to give the amount of insurance, but it will approximate to \$200,000. At this hour the fire is entirely under control, and no further damage is probable.

## THE GOODRICH MURDER.

CONTINUATION OF THE CORONER'S INQUEST—KATE STODDARD IN COURT—LUCETTE MYERS AND MARY HANDLE ON THE STAND.

The inquest in the Goodrich murder case which was indefinitely postponed about six weeks ago, was resumed on Saturday by Coroner Whitehill, at the New Court House Brooklyn.

About 11 o'clock Captain McConnell and Detective Folk reached the New Court House in a carriage, accompanied by Kate Stoddard.

Lucette Myers and three other witnesses arrived soon after.

The prisoner is a woman of slight figure and her form appears wasted by sickness. Her face is remarkable for extreme paleness, and a frightened expression has settled upon it. When she entered the Coroner's



Hammond, 12 gr. phosph. boiled  
in 3i almond oil, filtered & then  
added to ~~3ij gum arabic~~ - & 30 drops  
~~some aromatic~~ = P. gr.  $\frac{175}{24}$

Dr. Elam states that

in England, 1839, 1495 deaths

from brain diseases; 1869,

5,517 : pop. inc. 30 per cent.,

br. dis. inc. nearly 4 fold.

In same period <sup>deaths from</sup> Paralysis &  
apoplexy more than doubled.

(Roth on overwork)

1873

marked decrease of phosphorus

aged idiot brains. Roth  
(Héritier)

Salutary, occ. spirit.

On the  
Constitution

For brain



Dr. H. Lenox Hodge  
requests the pleasure of your company  
on *Tuesday* evening next  
at 8 o'clock.

903 Walnut St.



## Medical Department of Life Insurance.

### TOBACCO AND LIFE INSURANCE.

By E. R. MAXSON, M.D.,

OF SYRACUSE, N. Y.

THERE are so many in the Life Insurance business who use tobacco in some form or other, that it subjects one to the liability of bringing down upon himself the execrations of all thus under the influence of the weed, to even make a suggestion bearing upon the influence of the habitual use of tobacco in shortening human life.

And yet it must be admitted by every candid and well-informed man, not under its influence, and who has taken the pains to think, that the poisons of tobacco—nicotin, nicotianin, and its empyreumatic oil, as introduced into the human system, in the various modes in which it is used—by chewing, smoking, and snuffing—tend strongly, not only to produce various forms of fatal disease, but by directly depressing vitality, in every instance, to greatly lessen the average of human life; and, what is still worse, they cause a strong inclination for intoxicating drinks.

The fatal diseases caused by the poisons of tobacco are undoubtedly very numerous. But cancer of the lip, disease of the heart, and collapse of the nervous system, with symptoms very like apoplexy, may perhaps be the most frequent; and all of them are to be dreaded by life insurers. As an examiner, medical practitioner, and careful observer, in this country and abroad, I am confident that many other diseases, tending to shorten human life, indirectly, are the result of the habitual use of tobacco. I could, did space permit, refer to numerous cases that have fallen under my observation and care during the past year, in which there was a collapse of the nervous system, simulating apoplexy, and evidently a direct result of the accumulation of nicotin in the system, from the habitual use of tobacco. I was called to see one such case in a distant State, and the man recovered under the use of tonics; he was quite largely insured, as I learned; another, an insurance agent, less fortunate, because his disease was longer neglected, or not diagnosticated, died of imbecility, and so his agency wound up.

Intoxicating drinks, the terror of life-insurers, are taken as a rule, I am confident, by those who become habitual drunkards, to counteract the depression of vitality caused by the poisons of tobacco previously used. And hence, in tobacco may be found not only the direct cause of many fearful and fatal diseases, but also of most of the drunkenness and disease attending the use of intoxicating drinks.

Insanity is admitted to be a frequent result of the use of tobacco by those most competent to judge. And yet, I am not aware that life insurers have ever taken into account that tobacco produces an imbecility short of insanity, disqualifying all who use it in a greater or less degree from exercising that care and discretion in the observance of the laws of health which they might and would employ were they not under the influence of the poison. It should be remembered that very many physical and mental ills are thus produced, which, with all the direct effects, tend to make tobacco one of the most pernicious influences in destroying and shortening human life, and hence to be dreaded by life insurers.

In view of all the facts bearing upon this important subject, I respectfully suggest: That as human life is greatly shortened, directly and indirectly, by the use

of tobacco, if tobacco users are to be insured at all, their average of life should be estimated separately from those not addicted to its use, and they should be charged accordingly, thus relieving those not addicted to the use of the weed; and further, that all life insurance agents should be selected from among those not addicted to the use of tobacco.

### THE LONGEVITY OF BRAIN-WORKERS.\*

By GEORGE M. BEARD, A.M., M.D.,

OF NEW YORK.

THOMAS HUGHES, in his life of "Alfred the Great," makes a statement that "the world's hardest workers and noblest benefactors have rarely been long-lived."

That any intelligent writer of the present day, and especially a writer who, like Mr. Hughes, is a thoughtful student of mental hygiene, should make a statement so absolutely untrue, shows how hard it is to kill an old superstition.

The remark is based on the mischievous theory, which—against the clearest evidence of general observation—has been held for centuries, that the mind can be used only at the injurious expense of the body. This theory has been something more than a mere popular prejudice; it has been a professional dogma, and has inspired nearly all the writers on hygiene since medicine has been a science.

Between 1864 and 1866, while preparing a thesis for graduation, I obtained statistics on the general subject of the relation of occupation to health and longevity that convinced me of the error of the accepted teachings in regard to the effect of mental labor. These statistics, which were derived from the registration reports of this country and of England, and from a study of the lives of many prominent brain-workers, were incorporated in an essay on the subject, that was delivered before an Association of Army and Navy Surgeons in New Orleans in 1863, and afterwards published in the "Hours at Home" Magazine. The views I then advocated, and which I enforced by statistical evidence, were:—

1st. That the brain-working classes—clergymen, lawyers, physicians, merchants, scientists, and men of letters—lived very much longer than the muscle-working classes.

2d. That those who followed occupations that called both muscle and brain into exercise, were longer lived than those who lived in occupations that were purely manual.

3d. That the greatest and hardest brain-workers of history have lived longer on the average than brain-workers of ordinary ability and industry.

4th. That clergymen were longer lived than any other great class of brain-workers.

5th. That longevity increased very greatly with the advance of civilization; and that this increase was too marked to be explained merely by improved sanitary knowledge.

6th. That although nervous diseases increased with the increase of culture, and although the unequal and excessive excitements and anxieties attendant on mental occupations of a high civilization, were so far both prejudicial to health and longevity, yet these incidental evils were more than counterbalanced by the fact that fatal inflammatory diseases have diminished in frequency and violence in proportion as nervous dis-

\* An extract from the advance sheets of the Transactions of the American Public Health Association.



eases have increased; and also that brain-work is, *per se*, healthful and conducive to longevity.

Many of these views have since received various and powerful confirmation, and by a number of independent observers. The statistics on this subject I have endeavored to use without abusing them; to draw from them only those lessons that they are really capable of teaching. Among those classes who live mainly by routine and muscular toil (mechanics, artisans, laborers, etc.), change of occupation is the rule rather than the exception, especially in this country; and any statistics of mortality derived from the Registration Reports, are, so far as these classes are concerned, of but little value in the study of the relative effects of the different occupations on health and longevity. Another important complication arises from the fact that certain occupations, as clerkships, positions in factories, teaching, etc., are followed almost exclusively by the young and middle-aged; while other callings, as judgeships, are filled only by those in middle and advanced life. Another difficulty arises from the fact that some important occupations, as journalism, for example, are adopted only by a limited number; and the number in them who annually die is too small to afford any basis for comparison. But this generalization is, I am persuaded, admissible, that the greater majority of those who die in any one of the three great professions—law, theology, and medicine—have, all their lives, from twenty-one upwards, followed that profession in which they died. The converse generalization, that the great majority of those who die in the muscle-working avocations have all their lives followed some kind of muscle-working employment, however frequently they may have changed from one to another at different periods, is also true. Very few who once fairly enter theology, medicine, or law, ever permanently change to a purely physical calling; and, on the other hand, the number of those who begin life as farmers, laborers, and mechanics, and end it as lawyers, physicians, or clergymen, is quite limited, even in the United States, where every man has a better chance to follow the bent of his genius than in any other country.

A comparison, therefore, of the longevity of the professional and of the muscle-working classes, as derived from Registration reports, such as I have made, is quite justifiable. The value of this comparison would be vitiated if it could be proved that those who enter the professions are originally healthier and stronger, and come from better stock than those who enter physical avocations; but in this country, the practice has been to allow the more delicate members of a family to enter a profession, whilst the tough and hardy work on the farm or learn a trade. Here, as in Europe, there is growing up a distinctively intellectual class who live solely by brain-work; it is, however, not from this class alone, but from the farming, mercantile, and artisan class that the ranks of the professions are filled.

*Great Longevity of Great Men.* I have ascertained the longevity of five hundred of the greatest men in history. The list I prepared includes a large proportion of the most eminent names in all the departments of thought and activity.

It would be difficult to find more than two or three hundred illustrious poets, philosophers, authors, scientists, lawyers, statesmen, generals, physicians, inventors, musicians, actors, orators, or philanthropists, of world-wide and immortal fame, and whose lives are known in sufficient detail, that are not represented in the list. My list was prepared, not for the average longevity, but in order to determine at what time of life men do

their best work. It was, therefore, prepared with absolute impartiality; and includes, of course, those who, like Byron, Raphael, Pascal, Mozart, Keats, etc., died comparatively young. Now the average age of those I have mentioned I found to be 64.20.

The average age at death, at the present time, of all classes of those who live over twenty years, is *about fifty*. Therefore, the greatest men of the world have lived longer, on the average, than men of ordinary ability in the different occupations by fourteen years; six years longer than physicians and lawyers; nineteen or twenty years longer than mechanics and day laborers; from two to three years longer than farmers; and a fraction of a year longer than clergymen, who are the longest-lived class in our modern society. The value of this comparison is enforced by the consideration that longevity has increased with the progress of civilization, while the list I prepared represents every age of recorded history. A few years since I arranged a select list of one hundred names, comprising the most eminent personages, and found that the average longevity was *over seventy years*. Such an investigation any one can pursue; and I am sure than any chronology, comprising from one to five hundred of the most eminent personages in history, at any cycle, will furnish an average longevity of from sixty-four to seventy years. Madden, in his very interesting work, "The Infirmities of Genius," gives a list of two hundred and forty illustrious names, with their ages at death. The average I found to be sixty-six and a fraction.

In view of these facts, it may be regarded as established that "the world's hardest workers and noblest benefactors" have usually been very long-lived.

#### CAUSES OF THE GREAT LONGEVITY OF BRAIN-WORKERS.

The full explanation of the superior longevity of the brain-working classes, would require a treatise on the science of sociology, and particularly of the relation of civilization to health. The leading factors, accounting for the long life of those who live by brain-labor, are as follows:—

1. *The inherent and essential healthfulness of brain-work.* To work is to grow; and growth, except it be forced, is always healthful. It is as much the function of the brain to cerebration, as of the stomach to digest; and cerebration, like digestion, is normal, physiological, and healthful. In all organizations of force, the exercise of force develops more force; work evolves strength for work. A plant that is suffered to bud and bloom is more sturdy and longer lived than the plant that is kept from the light, or trimmed of all its blossoms. By thinking, we gain the power to think; functional activity, within limits, tends to vigor and the self-preservation of an organ, and of the body to which the organ belongs. The world has been taught that the brain can be developed only at the expense of the other organs of the body; granting that brain-work strengthens the brain itself, the rest of the body is impoverished thereby—hence disease, and early death. But recent investigations in cerebrophysiology, seem to indicate that the centres of thought in the anterior region of the brain, are also the centres of muscular motion; and hence it may perhaps be inferred that to develop the brain may be one method of developing the muscles.\* It is certain that the brain-working class are, on the average, well developed muscularly; and in size and weight are superior to the purely muscle-working classes.

\* I here refer to the experiments of Hitzig, of Berlin, on the electrical irritation of the brains of living animals.



2. *Brain-workers have less worry, and more comfort and happiness than muscle-workers.* Worry is the converse of work; the one develops force, the other checks its development, and wastes what already exists. Work is growth; worry is interference with growth. Worry is to work what the chafing of a plant against the walls of a greenhouse is to limitless expansion in the free air. In the successful brain-worker, worry is transferred into work; in the muscle-worker, work too often degrades into worry. Brain-work is the highest of all antidotes to worry; and the brain-working classes are therefore less distressed about many things, less apprehensive of indefinite evil, and less disposed to magnify minute trials, than those who live by the labor of their hands. To the happy brain-worker, life is a long vacation; while the muscle-worker often finds no joy in his daily toil, and very little in the intervals. Scientists, physicians, lawyers, clergymen, orators, statesmen, literati, and merchants, when successful, are happy in their work, without reference to the reward; and continue to work in their special callings long after the necessity has ceased. Where is the hod-carrier, that finds joy in going up and down a ladder; and, from the foundation of the globe until now, how many have been known to persist in ditch-digging, or sewer-laying, or in any mechanical or manual calling whatsoever, after the attainment of independence? Good fortune gives good health. Nearly all the money of the world is in the hands of brain-workers; to many, in moderate amounts, it is essential to life, and in large or comfortable amount it favors long life.

Longevity is the daughter of luxury. Of the many elements that make up happiness, mental organization, physical health, fancy, friends and money—the last is, for the average man, greater than any other, except the first. Loss of money costs more lives than the loss of friends, for it is easier to find a friend than a fortune. Almost all muscle-workers are born, live, and die poor. To live on the slippery path that lies between extreme poverty on one side, and the gulf of starvation on the other; to take continual thought of to-morrow, without any good result of such thought; to feel each anxious hour that the dreary treadmill by which we secure the means of sustenance for a hungry household may, without warning, be closed by any number of forces, over which one has no control, to double and triple all the horrors of want and pain, by anticipation and rumination,—such is the life of the muscle-working classes of modern civilized society; and when we add to this the cankering annoyance that arises from the envying of the fortunate brain-worker who lives in ease before his eyes, we marvel not that he dies young, but rather that he lives at all.

3. *Brain-workers live under better sanitary conditions than muscle-workers.* They have better food and drink, warmer clothing, breathe purer air, and are less exposed to fatal accident and the poison of disease. None of the occupations are ideal; none fulfil all the laws of health; but the muscle-working callings are all more or less unhealthy; tradesmen, artisans, common laborers, and even farmers (who combine muscle with brain-work), all are forced to violate sanitary law every hour of their lives; not one out of ten have enough good food; many are driven by passion and hunger to excess in the worst forms of alcoholic liquors; for a large number, sleep is a luxury of which they never have sufficient for real recuperation; healthful air is but rarely breathed by the laboring classes of any large city; exposure to weather, that brings on fatal inflammatory disease; accidents that cripple or kill—in all these respects,

the muscle-worker, as compared with the brain-worker, is at stupendous disadvantage.

4. *The nervous temperament, which usually predominates in brain-workers, is antagonistic to fatal, acute, inflammatory disease, and favorable to long life.* Comparative statistics have shown that those in whom the nervous temperament prevails, live longer than those in whom any one of the other temperaments prevail, and common observation confirms the statement. Nervous people, if not too feeble, may die every day. They live, but they do not die; they talk of death, and each day expect it, and yet they live. Many of the most annoying nervous diseases, especially of the functional, and some even of the structural varieties, do not rapidly destroy life, and are indeed consistent with great longevity. I have known a number of men and women who were nervous invalids for half a century or more, and died at an advanced age. It is one of the compensations of nervousness that it protects the system against those febrile and inflammatory diseases that are so rapidly fatal to the sanguine and the phlegmatic.

5. *Brain-workers can adapt their labor to their moods and hours and periods of greatest capacity for labor, better than muscle-workers.* In nearly all intellectual employments there is large liberty; literary and professional men especially, are so far masters of their time that they can select the hours and days for their most exacting and important work; and when from any cause indisposed to hard thinking, can rest and recreate, or limit themselves to mechanical details. Thus, there is less of the dreadful in their lives; they work when work is easy, when the desire and the power are in harmony; and, unlike their less fortunate brother in the mill or shop, or diggings, need not waste their force in urging themselves to work. Forced labor, against the grain of one's nature, is always as expensive as it is unsatisfactory; it tells on the health and on life. Even coarser natures have their moods, and the choicest spirits are governed by them; and they who worship their moods do most wisely; and those who are able to do so, are the fortunate ones of the earth.

Again, brain-workers do their best work between the ages of twenty-five and forty-five; before that period they are preparing to work; after that period, work, however extensive it may be, becomes largely a matter of routine. Lawyers and physicians do much of their practice after forty; but to practice is easy, to learn is hard—and the learning is done before forty or forty-five. In all directions, the French motto holds true: "It is the first step that costs." Successful merchants lay the foundations of fortune in youth and middle life, to accumulate, and recreate, and take one's ease in old age; thus they make the most when they are doing the least, and only become rich after they have ceased trying to be so.

With muscle-workers, there is but little accumulation, and only a limited increase of reward; and in old age, after their strength has begun to decline, they must, with increasing expense, work even harder than before.

To this should be added the consideration that manual employments cost as much force after they are learned as before; they can never, like many intellectual callings, become so far forth matters of routine as to require little effort. It is as hard to lay a stone wall after one has been laying it fifty years, as during the first year. The range of muscular growth and development is narrow, compared with the range of mental growth; the day-laborer soon reaches the maximum of his strength. The literary or scientific



worker goes on from strength to strength, until what at twenty-five was impossible, and at thirty difficult, at thirty-five becomes easy, and at forty a pastime; and besides he has the satisfaction that the work done so easily at thirty-five and forty is incomparably better than the work done with so much difficulty at twenty-five.

6. *Comparative Longevity of the Professions.* Inasmuch as professional men do not usually change their callings, but die in the special profession in which they have lived, the vital statistics, at least of lawyers, physicians, and clergymen become of value in determining their comparative longevity. I found in my researches made several years ago, that lawyers and physicians lived to be about fifty-seven or fifty-eight.\*

#### CAUSES OF THE EXCEPTIONAL LONGEVITY OF GREAT BRAIN-WORKERS.

The explanation of the surprising longevity of great brain-workers is quite complex. The readiest answer to the problem would be that brain-work is healthful; and that, therefore, the better the brain and the harder it is worked, the longer the life of its possessor. Such a solution would not be entirely true; and if it were true unqualifiedly, it would clear up but one side of the question.

The answer is to be found, not in any single consideration, but in many, as follows:

1. *Great men usually come from healthy, long-lived ancestors.* Longevity is a correlated inheritance of genius. In order that a great man shall appear, a double line of tough, more or less vigorous fathers and mothers must fight in the struggle for existence and come out triumphant. However feeble the genius may be, his parents or grandparents are usually strong; or if not strong, are long-lived. Great men may have nervous if not insane relatives; but the nervous temperament holds on to life longer than any other temperament. Longevity is, of course, hereditary, like all qualities or tendencies of organized life; and if great men come from long-lived stock, this fact is one most potent explanation of their exceptional longevity.

2. *A good constitution usually accompanies a good brain.* The cerebral and muscular forces are correlated. This view, though hostile to the popular faith, is yet sound and supportable. A large and powerful brain in a small and feeble body is a monstrosity. "In monstrosities Nature reveals her secrets," says Goethe. When a specially small and delicate frame sustains a specially large and potent brain, men wonder, as at a tree bowed to the earth by the weight of its over-abundant fruit. Everywhere Nature is a slave to the necessity of correlation or correspondence of parts and organs with each other; and unless she heeds it, all organized life would become awry and misshapen. In all the animal realm there is a general though not unvarying relation between the brain and the body of which it is a part, and to which it ministers.

3. *Great men who are permanently successful have*

*correspondingly greater will than common men; and force of will is a potent element in determining longevity.* The one requisite for great success is "grit;" and, more uniformly than any other single quality or combination of qualities, it is found in those who attain high distinction. That longevity depends not a little on the will, no one will dispute. The whole subject of the relation of mental character to longevity is one of vast interest, and is too far-reaching to be here discussed; but this single point must be granted without argument, that of two men every way alike and similarly circumstanced, the one who has the greater courage and grit will be the longer lived. One does not need to practice medicine long to learn that men die that might just as well live if they resolved to live; and that myriads who are invalids could become strong if they had the native or acquired will to vow that they would do so.

4. *Great men work more easily than ordinary men.* Their expenditure of force to accomplish great things is less plenteous than the expenditure of ordinary men to accomplish such things. A Liverpool draft-horse draws with ease a load at which a delicate racer might tug and strain without moving it. Ruskin is quite right when he says that the greatest work is done easily. The best action is the unconscious. It is the essence of genius to be automatic and spontaneous. The common mind cannot attain this spontaneity, or, at any rate, only to a slight degree.

5. *The advantages that belong to the brain-working orders in general.* Of these I have already spoken in some detail. The great brain-workers of the world have not all been rich; neither have they all been poor; some of them have lived a portion of their lives, but very few all their lives, in extreme want; and the majority have been most of the time surrounded with at least moderate comforts.

#### CAUSES OF THE GREAT LONGEVITY OF CLERGYMEN.

When, in 1867, I first called attention to the fact that clergymen were longer-lived than any other class of brain-workers, serious doubt was expressed whether there might not be some error in my statistics. So much has been said of the pernicious effects of mental labor, of the ill-health of brain-workers of all classes, and especially of clergymen, that very few were prepared to accept the statement that the clergy of this country and of England lived longer than any other class, except farmers, and very naturally suspected a lurking fallacy. Other observers, who have since given special attention to the subject, have more than confirmed this conclusion, and have shown that clergymen are longer-lived than farmers.

The Rev. Josiah F. Tuttle, D.D., President of Wabash College, Indiana, has ascertained the ages of 2,442 clergymen—600 Trinitarian Congregationalists, 317 Presbyterians, 231 Episcopalians, 268 Baptists, 208 Methodists, 166 Unitarians, etc.—and found that the average was "a little over 61 years." "Considerably over one half of the whole were over 60 years of age at their death; three fourths of the whole were over 50 years old at death; and seven-eighths of the whole were over 40 years of age at death." Dr. Tuttle found that the average age at death of 408 individuals (not clergymen), and who had died over 21 years of age, was a little over 51 years. This result pretty nearly corresponds with mine.

But by far the more thorough investigation on this subject, and one that must fully settle the question for all minds over whom facts have any influence, has been recently made by Rev. J. M. Sherwood, formerly editor of "Hours at Home," and now Secretary of the

\* "An investigation made by a Berlin physician into the facts and data relating to human longevity shows the average age of clergymen to be 65; of merchants, 62; clerks and farmers, 61; military men, 59; lawyers, 58; artists, 57; and medical men, 56. Statistics are given showing that medical men in England stand high in the scale of longevity. Thus, the united ages of twenty-eight physicians who died there last year, amount to 2,354 years, giving an average of more than 84 years to each. The youngest of the number was 80; the oldest, 93; two others were 92 and 89 respectively; three were 87, and four were 86 each; and there were also more than fifty who averaged from 74 to 75 years."



"Society for Promoting Life Insurance among Clergymen." This gentleman has labored long and patiently in this department, and has ascertained that the average age of our ministers at death is sixty-four. The report (I quote from Document No. 3 of the Society) states: "this is four years more than the longevity of the most favored (?) class; ten years more than in the other professions: and from twelve to nineteen years above that of mechanics, artisans, miners, operatives, and the like."

These conclusions differ slightly from mine, but the difference is in favor of clergymen. Mr. Sherwood informs me that he had obtained the average from a list of ten thousand clergymen, whose ages at death he ascertained at great labor by consulting "the minutes of ecclesiastical bodies for thirty years past, the catalogues of theological seminaries, Wilson's 'Historical Almanac,' Dr. Sprague's 'Annals of the American Pulpit,' biographical dictionaries, the files of religious journals, etc."

A list of ten thousand is sufficient and more than sufficient for a generalization; for the second five thousand did nothing more than confirm the result obtained by the first. It is fair and necessary to infer that if the list were extended to ten, twenty, or even one hundred thousand, the average would be about the same.

In England, also, clergymen live to a greater age than any other class. According to the report of the Secretary of the Clerical Mutual Life Assurance Society, the mortality is less than that in twenty other companies by a very important percentage.



## CAL RECORD.

which, when the lungs were cut, flowed over the hands of the operator. But the parenchyma of the lungs was unaffected, so that in this case the cause of death cannot be ascribed to the anthracosis. This case is typical of many others, where the inhalation of dust under the worst circumstances has been followed by no perceptible ill effects.

"But in by far the greatest number of cases a different state of things exists.

"We find just beneath or even in the pleura pulmonalis, black deposits, which occur mostly in spots, rarely in stripes. In certain places rather hard, black nodules occur, from the size of a pin's-head to a pea, which consist wholly of coal particles, or we find perfectly ink-black indurations, which grate under the knife. Chronic pneumonic processes occur also, terminating in caseous degenerations, but they are rare. Cavities are very seldom found, according to Seltman, and they are mostly of small size, lie partly in inflated tissue, partly in indurated portions, and may be situated in any part of the lung. Their walls are uneven and ragged, and the contents of the cavities consist of pus merely, or they are colored gray or black, through the presence of coal granules. Possibly true tubercles may at length develop. When the dense accumulations of coal approach near to the periphery small circumscribed pleuritic effusions may take place, which may culminate in general pleurisy. In all cases, without exception, enlargement and pigmentation of the bronchial glands occur. No other observer besides Villaret, so far as we know, has ever found any coal deposits in other organs."

...ic affections, such as dilatation



Dr. Cohn, Breslau,  
ex. eyes of 10,060  
children.

Element, school — 6.7 per cent.

Intermed. " 10.3

Realschule 19.7

Gymnasium 26.3

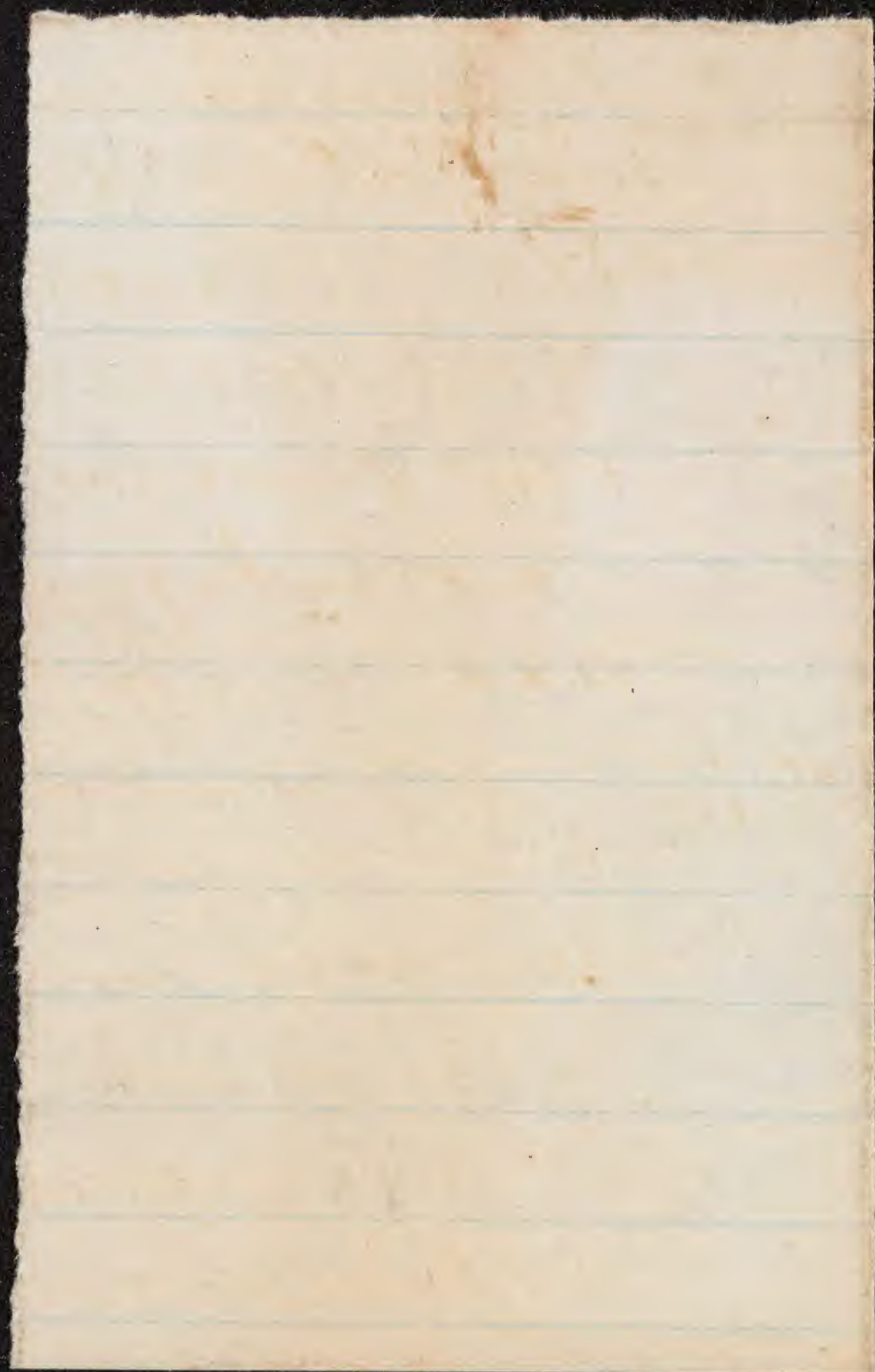
Erismar, St. Petersburg  
in 4,358 scholars —

30.2 per cent. myopic.

At 8 years, 10.2 per cent.

20 years, 40 per cent.







The following shows the admissions and discharges since the opening of the Hospital, and of those remaining at the end of the year:

|             | Males. | Females. | Total. |
|-------------|--------|----------|--------|
| Admissions, | 2937   | 2598     | 5535   |
| Discharges, | 2780   | 2442     | 5222   |
| Remaining,  | 157    | 156      | 313    |

Of the whole number there were 1472 single males, 1984 females, 1332 males married, 1183 females married, 331 widows and 133 widowers; 4612 were residents of Pennsylvania. Of the 2937 male patients, 377 were farmers, 287 merchants, 244 clerks, 228 laborers, 59 physicians, 59 lawyers, 59 seamen and watermen, 65 manufacturers, 91 shoemakers, 41 tailors, 36 hotel keepers, and 401 had no occupation. Of the females, 124 were daughters of farmers, 150 of merchants, 149 wives of laborers, 167 do. of merchants; 246 were seamstresses or mantua makers, and 263 were domestics. The cases of the



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# Ratio of Insanity in the U.S.

|                    |   |    |      |
|--------------------|---|----|------|
| Vermont            | 1 | in | 455  |
| Massachusetts      | 1 | in | 584  |
| Rhode Island       | 1 | in | 607  |
| New Hampshire      | 1 | in | 644  |
| California         | 1 | in | 833  |
| Maine              | 1 | in | 892  |
| New York           | 1 | in | 899  |
| Virginia free pop. | 1 | in | 935  |
| S. Carolina " free | 1 | in | 1008 |
| Ohio               | 1 | in | 1020 |
| Penn.              | 1 | in | 1050 |
| Miss. free pop     | 1 | in | 1503 |
| Conn.              | 1 | in | 1637 |
| Alabama free pop   | 1 | in | 2351 |
| Louisiana " "      | 1 | in | 2851 |
| Texas " "          | 1 | in | 3765 |
| Florida " "        | 1 | in | 3934 |
| Arkansas " "       | 1 | in | 3955 |



|                   |      |        |
|-------------------|------|--------|
| Minnesota         | 1 in | 69 54  |
| Louisiana negro   | 1 in | 89 65  |
| Kansas            | 1 in | 107 20 |
| Mississippi negro | 1 in | 121 29 |
| Florida           | 1 in | 123 49 |
| Alabama "         | 1 in | 135 96 |
| Texas             | 1 in | 140 43 |
| A. Kansas         | 1 in | 222 23 |
| S. Carolina "     | 1 in | 223 56 |

|                        |      |                     |
|------------------------|------|---------------------|
| Population New England |      | 3,135,283           |
| Southern Negroes       |      | 3,608,299           |
| Ratio of New England   | 1 in | 685 $\frac{1}{4}$   |
| Ratio of Negroes       | 1 in | 1022 $1\frac{1}{3}$ |

Preliminary Report of the Eighth Census by  
 Jas. G. Kennedy Esq. under the direction  
 of Caleb B. Smith Secretary of the Interior.



There still remained the South Yorkshire Asylum to be visited. This is a large, new building, a few miles out of the town. It is an offshoot from the parent institution, the West Riding Asylum, at Wakefield, now so well known by the annual reports of the late superintendent, Dr. Crichton Browne. Dr. Mitchell, the superintendent of the Sheffield Asylum, had kindly invited members of the Association to visit the institution. During a tour of inspection, he informed me that the chief form of insanity seen there was general paralysis, of which alone there were twenty-five deaths in a year; the total number of inmates being about eight hundred. A quarter of all the male admissions were general paralytics. He said this form of disease was common in all coal-mining districts, and attributed such prevalence to reckless living, hard work, and every form of indulgence, together with toil in a foul atmosphere. A fair number of these general paralytics go out greatly relieved, or even apparently cured, by general measures, as rest and quiet, without any special medicinal treatment. The disease, however, invariably returns. From the iron-workers come many cases of acute mania, differing widely in their violence from the cases furnished by the agricultural districts. This savage violence Dr. Mitchell attributed partly to the character of their labor, and partly to their training, or rather the want of it. The women are largely sufferers from melancholia, though an unusually large proportion were general paralytics, from their habits approaching those of the men. A number of idiotic children of the worst class were to be seen, the better ones having been sent away to the North Country Earlswood, the Albert Institute, at Lancaster. One patient excited much compassion. She was a very handsome lady, of fine physique, sitting playing the piano, apparently indifferent to the crowd of homely lunatics by which she was surrounded. She said it was no place for her; and on that point she was quite correct. She had been found by the police a couple of days before, wandering about in Sheffield, penniless, and declining to say where her friends were, but with some obvious delusions referring to property. She formed a very marked contrast to the rest of the patients. The whole of the management of the South Yorkshire Asylum is such as to reflect credit alike on the committee and the medical officers.



ward received a perfect holiday dress. The house is a perfect répertoire of works of art, and its inspection gave great pleasure to the privileged members. A most generous luncheon was very acceptable after the long drive, and the popping of the champagne-corks was very lively. After this all strolled into the grounds, and not a few went under the falling spray of the great fountain and got well wetted in the drenching shower, which was very pleasant after the great heat of the drive. Then the cortège went further afield to the ruined seat of the Dukes of Rutland, Haddon Hall. Here there were ancient yew-tree arbors, pleasant old terraces, and silent rooms with old oak-panelling, affording opportunities for the interchange of courtesies betwixt bachelor members and the fair friends of other associates. Certainly the scene was romantic enough, and the very place for flirtations to develop into something more serious and permanent. The social uses of this Association are well demonstrated on the Saturday afternoons. At five, farewells were interchanged, and all those who were bound for London that night gathered to a drag waiting to carry them to a neighboring station, whence the Midland provided them a Pullman car direct for town. The bulk, however, returned to Sheffield, going round by Bakewell and along a stream which made a fly-fisher's fingers itch to get hold of a rod. Just as we had again mounted the summit of the moors the moon shone out brightly, as if even the elements wished to favor the excursion to the utmost; and in its pleasant light we rolled steadily down the slope to our resting-places in the town, getting home at ten, having had a glorious twelve hours.

On Sunday morning the infirmary suggested itself, lack of time having prevented its inspection before. It consists of the old infirmary, and a smaller new block for infectious or contagious cases. It is kept thoroughly clean, the wards were not too crowded, and were free from any objectionable odor. There had been no attempt made to collect a lot of show cases, and the hospital was in its wonted every-day working order. Burns, of course, were very common; there was no special treatment, unless that opium was given less timorously than is usually the case. A good dose of opium is found to give great comfort, and not to add to the shock of the burn. There was also a very strange case of mollities ossium in a boy.



STATISTICS OF SUICIDE. The statistics of 1870 show an increasing tendency to suicide throughout the country. The percentage was 3.06 per hundred thousand. In 1860, it was 3.02, and in 1850, 2.01. Now it occurs to us that a comparison of these ratios, with the percentage of suicides occurring in our life companies, would go a good way towards settling the bearings of the suicide clause.

If the proportion of suicides bears no heavier on the insured than on the country at large, it is a pretty strong argument in favor of those who hold that no man in his right mind will destroy his life for the sake of the insurance. But if, as we are inclined to suspect, cases of self-murder are excessive among this class, the companies ought,—in the interests of society, as well as their own—to take away all mercenary motives to the crime.

As usual, the male sex greatly predominates among the victims; more than three-fourths are men. Suicide is rare among women who have reached maturity; the majority of the cases are confined to the romantic period of girlhood. Men, on the contrary, resort to this extreme remedy in numbers increasing with age. Ten suicides occur among the whites, to one among the blacks. The cheerful, contented disposition of the latter shows where lies the exciting cause of suicide. It is the product, not of mental rust, but of wear and tear. The rate is higher in the bustling communities of the North than in the more quiet South.

But the German and French minds, of all others, appear to be particularly prone to the disease. These nationalities stand nearly as three to one in the percentage of suicides, compared with the Irish, and four to one compared with the native Americans. The depressing effect of forsaking home and country is exhibited in the heavy ratio among all classes of our foreign population.—*Insurance Monitor*.



hands of the agent to be forwarded to the home office.

To illustrate one of these annoyances, the following is an example: Several years since an agent of a prominent New England Life-Insurance Company called at my office with a young man who had given him an application for life insurance, desiring me to make the examination. The agent, at one time a clergyman, proposed that he should sit by the desk and record my examination as I should dictate it to him. This I declined to do. Not finding the certificate altogether suited to his purpose or fancy, he quite insisted on my making certain modifications in my statements concerning the applicant's condition. It is perhaps unnecessary to state in this connection that our parting was of such a nature that he never again requested my services, though he continued to receive applications for insurance in our town.

I would not wish it inferred that Life-Insurance agents are generally dishonorable men; on the contrary, I have in mind those who I know would not willingly be accessory to securing a policy through false representations or upon an unsound life.

For reasons of a professional nature the common method of delivering certificates of examination to Life Insurance agents direct is open to serious objections. In the event the examiner, in the discharge of an imperative duty, rejects the party as unsound or not entitled to a policy, the agent informs the applicant as to the cause of his not receiving a policy, and throws the whole responsibility upon the examiner, when justice to the examiner requires that neither the agent nor applicant should be allowed the privilege of knowing whether this responsibility rested with the surgeon or the company.

For prudential reasons, which will suggest themselves to any mind, pension examining surgeons are instructed to transmit their certificates of examination to the Pension Office under seal, without allowing the applicant any knowledge as to their import. I would



EFFECT OF EXTREME COLD ON MIND AND BODY.—

M. Payer, the eminent Arctic explorer, referring to a certain day on which the thermometer indicated  $58^{\circ}$  Fah. below zero, says that so great an amount of cold paralyzes the will, and that, under its influence, men, from the unsteadiness of their gait, their stammering talk, and the slowness of their mental operations, seem as if they were intoxicated. Another effect of such cold, mentioned by M. Payer, is a tormenting thirst, which is due to the evaporation of the moisture of the body. It is unwholesome, too, to use snow to quench the thirst, as it brings on inflammation of the throat, palate, and tongue; besides, a temperature of  $35\frac{1}{2}^{\circ}$  to  $58^{\circ}$  below zero, Fah., makes it taste like molten metal. Snow-eaters in the North are considered as feeble and effeminate, in the same way as is an opium-eater in the East.



pices, the Protector

MEDICAL DEGREES FOR WOMEN IN GREAT BRITAIN  
—A bill to amend the medical act as far as it relates to the registration of women who have taken the degree of doctor of medicine in a foreign University is now before the British Legislature. The present law refuses to recognize men as practitioners of medicine who are not possessed of British qualifications, but it is proposed to make exceptions to this in favor of females. On this subject, the London *Lancet* truly says: "If certain foreign boards of examination are to be recognized as competent to say what persons are fit to practise medicine in this country, it is absurd to restrict the recognition of their competency to the case of females only. The Legislature would surely not commit itself to so silly an enactment as that of two persons, one a female and the other a male, possessed of foreign degrees, the female should be admitted to



ART. II.—*On the Cause of Intermittent and Remittent Fevers, with Investigations which tend to prove that these Affections are caused by certain species of Palmellæ.* By J. H. SALISBURY, M. D., Professor of Physiology, Histology, and Pathology in Charity Hospital Medical College.

ALL views upon the origin of malarious diseases, up to the present, have been purely hypothetical. No one has attempted a detailed series of investigations connected with the expectoration and other excretions of the human system; the bodies suspended in the night air of malarious levels and inhaled, and the tracing of such abnormal bodies to their true source; and finally the developing of ague paroxysms with these bodies. With these few remarks, we will proceed to a brief description of our researches regarding the origin and cause of intermittent fever.

During a lengthy series of careful experiments, connected with camp diseases, and those affecting vegetation, as the "curl in peach leaves," and the "blight in apple, pear, and quince trees," &c., and in studying the causes and consequences of fermentation, gangrene, decay, and the changes going on in diseased tissues; I was led by some of the experiments connected with bodies suspended in the atmosphere, to inquire into the causes of fevers, and especially those of an intermittent type.

Intermittent fever began to show itself in the rich malarial districts of the Ohio and Mississippi valleys, in 1862, during the month of May. It did not, however, prevail to any great extent till the months of July and August. The weather had been unusually damp up to about the first of July. During the months of July, August, and September there was scarcely any rain. Springs and streams became very low, swamps and humid grounds became dry, vegetation almost entirely ceased to grow, and the country presented all the signs of a severe drought. Soon after the dry weather commenced, intermittent fever, in malarial districts, became quite general. The disease rapidly increased during the months of July and August, till it had invaded nearly every family on ague levels.

The observations were commenced by examining microscopically the expectoration of those labouring under intermittent fever, and who resided upon ague levels and were exposed during the evening, night, and morning to the cool, heavy, damp exhalations and vapours rising from stagnant pools, swamps, and humid low grounds; in short, those who were constantly immersed in a malarial atmosphere, and where every one was more or less affected with symptoms of miasmatic poisoning.

The first salivary secretions and mucous expectoration of the morning, were those used. In these secretions occurred a great variety of zoosporoid cells, animalcular bodies, diatoms, dismidia, algoid cells and filaments, and



fungoid spores. The only constant bodies, however, uniformly found in all cases, and usually in great abundance, were minute oblong cells, either single or aggregated, consisting of a distinct nucleus, surrounded by a smooth cell-wall, with a highly clear, apparently empty space between the outside cell-wall and nucleus. Their peculiar appearance satisfied me early in the examination that they were not fungoid, but cells of an algoid type, resembling strongly those of the palmellæ. This part of the inquiry was extended to a great number of individual cases, on the low malarial levels, and to persons residing on elevated lands near and far removed from malarial influence. Whenever the mucous secretions were examined, from persons residing above the summit plane of ague, these bodies were invariably absent. They were found only below the summit ague line; whereas, diatoms, dismidia, fungoid spores, and animalcular bodies, extended to some extent to all heights above the ague line; especially were they found in the vicinity of damp high grounds and streams.

After satisfying myself that these minute cells were the only forms found that could be relied upon as constantly present, on malarial levels and not present above them, my next step was, if possible, to trace their source and character.

In order to effect this, I commenced suspending rectangular plates of glass, sixteen by twenty-two inches, about one foot above the surface of stagnant pools and marshy grounds that were partially submerged. The plates were placed horizontal, each resting on four pegs, a single peg supporting each corner of a plate. The plates were placed in position at dusk, and secured in the morning before sunrise. Invariably the under surface of plates would be covered thickly with large drops of water. This condensed vapour was subjected to careful microscopic examination. Many of the cells were found that occurred in the expectoration; but none of those minute oblong cells, so uniformly present in the morning expectoration, were met with. On the upper surface of the plates, however, these bodies were found in considerable numbers. I repeated these experiments for many nights, varying widely the localities, with the same results.

In passing to the stagnant pools and swampy grounds southeast of the city of Lancaster, Ohio, to suspend the glass plates, I had to pass over a rich, peaty prairie bog, where the water had become mostly dried off, and the surface broken by the tread of cattle. I had noticed that in walking over this ground, a peculiar dry feverish sensation was always produced in the throat and fauces, often extending to the pulmonary mucous surfaces, and that my expectoration was, after returning, uniformly filled with the minute oblong cells above described. This drew my attention to the partially desiccated peaty prairie bog, where the surface had been recently broken by the tread of cattle. I discovered on the recently exposed earth, what appeared to be a whitish mould, or more closely the incrustation of some salt. I here suspended the plates of glass, and the following morn-



ing, much to my delight, found the inferior surface of the plates covered with the minute cells, which I was in pursuit of. I immediately returned to the bog and secured samples of fresh earth, which were covered with the incrustation, and some which were not, and also portions of the boggy turf. On placing a fragment of the incrustation under the microscope, it was at once discovered to be made up of aggregated masses of the minute cells so uniformly met with in the expectoration of those exposed to the influence of the heavy cool vapours of malarial levels. It was further seen that these cells were algoid, and emanated from plants of a palmelloid type, as we had previously suspected. That there were several species, and that in the larger ones, grew several species of mucidinous fungi.

The locality where these first results were obtained is situated on the southeast side of the city of Lancaster, between the canal and railroad, and just east of the depot and starch factory. Here stretches out to the southeast, along the canal, a low peaty, prairie bog, and in its vicinity the surrounding bottoms are low and humid. The portion of the town (3d ward) adjoining this bog, or all of it situated below a line about thirty-five to forty feet above the bog, has always been a fertile field for intermittents. Those living immediately on the edge of the bog are frequently subjects of ague, yearly, from May till November. August and September are usually the worst months.

To determine how high above the low grounds the bodies found on the under surface of the suspended glass plates were elevated, both at night and day, a small apparatus was used, which consisted of a glass screen standing perpendicular, and in front of it a large funnel, with the broad open end pointing from the screen, and the small end terminating within one-half inch of it. This was arranged on a pivot, and so constructed that the force of the currents of air kept the broad mouth of the funnel towards the wind. When an observation was to be made, the screen was covered with a concentrated solution of chloride of calcium, and the apparatus suspended at the desired height and left for one hour. The wind passing through the funnel, and falling upon the coating of calcium, deposits its small suspended particles upon the smeared screen. On examining under the microscope the liquid on the screen, after an hour's suspension, all the bodies floating in the atmosphere are found. By suspending this apparatus at different heights above the low ague levels, at all hours of the day and night, the following facts have been ascertained :—

1. That cryptogamic spores and other minute bodies are mainly elevated above the surface during the night. That they rise and are suspended in the cold, damp exhalations from the soil, after the sun has set, and that they fall again to the earth soon after the sun rises.
2. That in the latitude of Ohio, these bodies seldom rise above from thirty-five to sixty feet above the low levels. That in the northern and



central portions of the State, they rise from thirty-five to forty-five feet, while in the southern, from forty to sixty feet.

3. That at Nashville and Memphis, they rise from sixty to one hundred feet and more above the surface.

4. That above the summit plane of the cool night exhalations, these bodies do not rise, and intermittents do not extend.

5. That the day air of malarial districts is quite free from these palmeloid spores, and from causes that produce intermittents.

With the view of tracing more carefully the symptoms of the local fever, produced in the mouth, fauces, throat, and lungs, by inhaling the cells and sporoid bodies emanating from the vegetable organisms forming the incrustations on the drying, rich, freshly exposed soil of malarial grounds, I visited, Sept. 2d, 1862, the bog above referred to and spent some time in wandering over its surface, examining the incrustation, and in collecting samples for further microscopic study. In a very few minutes after my arrival on the bog, I began to feel a dry, feverish, constricted feeling in the mouth, fauces, and throat. This feeling increased till the fauces and throat became very unpleasantly parched and feverish. The opposite walls in swallowing adhered together, and the normal mucous secretions were quite entirely checked. There was a constant desire to swallow and hawk and spit, without being able to raise much, or to relieve in the least the dry, feverish, constricted sensation. This feeling soon extended to the bronchial and pulmonary surfaces, which became dry, feverish, and constricted, with a heavy congested sensation and dull pain. These peculiar symptoms lasted about two hours after leaving the bog before they entirely disappeared. The malarial matters inhaled appeared to be poisonous to the surfaces with which they came in contact; and there seemed to be an effort on the part of the exposed mucous surfaces to close up their absorbent and secretory organs, until this poisonous matter could be dislodged by the swallowing, and hawking, and spitting which they excited.

On the morning of the 3d of September I again visited the bog, to obtain more specimens for examination, and to study still further the symptoms produced by inhaling the malarious matters of ague bogs. I remained walking over the surface for about half an hour. The same train of symptoms manifested themselves that I experienced on the previous visit, being quite as severe and lasting quite as long.

On the evening of the third, just at dusk, I again visited the bog to suspend glass plates. I remained about fifteen minutes. I had scarcely left the ground when the dry, constricted, feverish feeling of fauces and throat commenced; and I experienced the same train of symptoms as on the previous occasion. Between this and the last of October I daily visited this and other similar bogs, always with the same result.

On Sept. 18th, Dr. Effinger, at my request, accompanied me over the bog, with the view of determining whether he would be affected with the



same train of symptoms as myself. In a very few minutes after our arrival the symptoms began in his case, as in my own, and he described them precisely as they have been already stated.

On Sept. 20th Dr. Boerstler walked over the bog with me and experienced the same symptoms. Dr. B. remarked that he had often experienced the same, or similar sensations before, without knowing the cause.

Numerous other persons, who visited with me ague grounds, were invariably affected with the same train of symptoms.

The only constant foreign bodies found in the expectoration of those affected with the above local symptoms produced by walking over ague grounds, and in the expectoration of those immersed in the night emanations of malarial levels, were the minute palmelloid cells previously described. The source of these cells was found to be the palmelloid plants growing in such profusion on the drying soil of ague lands during the prevalence of intermittents. It is hence inferred that the minute cell emanations from these low vegetable organisms are capable of exciting local fever in the mucous surfaces with which they come in immediate contact; and further, that there is strong presumptive evidence from what has been previously determined, that by repeated and continued exposure to them they may cause general fever of either an intermittent or remittent type. This will appear more conclusive after perusing carefully the observations and experiments which follow.

On the northwest side of Lancaster, in the vicinity of the old canal mill, is another district of considerable extent, where the people are universally subject to ague. With the view of exploring for the local cause, I visited the locality Sept. 12th. Immediately west of this infected district is a wide low rich prairie. A few rods south of the mill and also west of it, I found the ague palmellæ growing luxuriantly, covering the surface of the soil recently thrown up by moles and exposed freshly by the tread of cattle. In fact, over the entire prairie, wherever the soil had been recently exposed the plants were developing in profusion. While collecting samples for microscopic examination, I became affected with all the peculiar symptoms of local fever previously described.

On the north edge of Lancaster, immediately on the west and south sides of Mount Pleasant, is another locality where ague prevails in its worst form; often running into fever of a remitting and continued type. There is a low belt of ground running through this locality, along which are stagnant pools of water. Around these pools and in the rich humid broken soil of the vicinity, I found the ague palmellæ growing in profusion. While collecting specimens for examination, I experienced all the symptoms of local fever as previously mentioned.

On the Columbus road, about one mile northwest of Lancaster, on the farm adjoining on the north the old Tallmadge place, occurred suddenly, about the middle of September, a severe case of ague in a strong healthy



young man. This locality had been previously exempt from the disease. I visited the point with Dr. Effinger, who was attending this patient. About fifteen rods south of the house, we discovered a new ditch about ten rods long, running through a piece of low, black, humid ground. The freshly thrown out earth and the sides of the ditch were covered with ague palmellæ. While examining the soil along the ditch and collecting specimens for the microscope, the mouth, throat, and pulmonary surfaces became dry and congested as in previous instances.

This ditch was dug by the young man about two weeks previous to his attack.

On Sept. 21st, in company with Dr. Effinger, I visited Mr. C. and family who reside five miles northwest of Lancaster, in a locality previously exempt from ague. Mr. C. was attacked with a severe form of the tertian type of intermittent fever on Sept. 1st, and his wife on Sept. 3d. The paroxysms were arrested on the fourth day of the disease with quinia, by Dr. E., their attending physician. Relapse on the 15th; was arrested after the second paroxysm. Both Mr. C. and wife, on Sept. 21st, were much debilitated, pale and sallow. Mr. C.'s house stands upon the edge of a low terrace, elevated about 30 feet above the prairie bottom, which approaches within fifteen rods of it, on the south and southwest sides. About fifty poles southwest of the house, a small creek, running through the prairie bottoms, empties into the canal. This creek, during rains, washes in sediment and makes a troublesome bar across the canal. The lessees of the canal had purchased, a short time previous, of Mr. C. an acre of ground at the mouth of this creek for the purpose of excavating there a reservoir to receive the sediment of the creek. About the middle of August, the workmen began the excavation. The soil excavated was a rich, peaty loam, with some black and blue clay. Very soon after the excavating was commenced, the workmen began to be taken down with ague, and very soon nearly every man was labouring under the disease. On Sept. 1st Mr. C. was attacked; on the third Mrs. C. was taken down with the same type. On Sept. 21st Dr. Effinger and myself visited the excavation, and found the excavated soil covered with "ague plants," a quantity of which were collected for examination. While gathering them, both Dr. E. and myself were affected with the symptoms of local fever as previously described. Mr. C., who accompanied us to the excavation, became so much affected in the throat, fauces, and lungs, that he had to retire from the place. Mr. C. stated that he and his wife slept in a room in the southeast corner of the house, on the lower floor; while the children, seven in number, ranging in age from two to fourteen, slept on the second floor, immediately over theirs. He and his wife were attacked with ague on the first and third of September, while all his children were entirely exempt and perfectly well. He also stated that early every morning he noticed that the "fog" from the reservoir grounds extended to the house, and rose



about two-thirds the way up the first story, and entered freely his sleeping apartment through the open window, and had the same odour as the soil containing the ague plants, and produced the same febrile symptoms in the throat and fauces. He never had noticed this fog to rise as high as the second story window where his children slept. The foggy vapour dissipated soon after sunrise and before his children were up. He stated that he had lived there over forty years, and had never had the ague before. That all his neighbours around, on the same and lower levels, were now suffering from the disease. I mention this case particularly, as it is of peculiar interest, showing in a striking manner a quite fixed and marked line indicating the summit plane of invasion, above which the malarious causes do not extend.

In the eastern half of the city of Lancaster stands a hill, having an area of about one hundred acres. Upon its sides and summit the finest portion of the town is built. This hill rises to the height of about sixty feet above the adjacent low prairie bottoms, on its south and southeast sides. The heavy, cold, night vapours, emanating from these bogs, rise within fifteen feet of its summit. The upper surface of these vapours, in the morning before sunrise, is seen, from the surrounding hills, to be a broad, level plain, limited by its contact with the adjacent hills. The line described around this hill, by the upper surface of these vapours, is a horizontal one, and marks distinctly the ague line. All of those living on the hill above this line are exempt; all below are subject to the disease. The line is so well defined that, of people living on different floors of the same house, those on the upper floor are exempt, while those on the floor below are frequently all down with the disease. If any cases occur above the summit ague plane, they are found to be in such persons as frequent the lower levels during the evening or early morning.

During the summer of 1862, and especially during the months of August and September, intermittent fever prevailed to a remarkable extent in the town of Carroll, situated on the canal, between Lancaster and Columbus. The site of the town and much of the surrounding country is low, and many boggy places occur along the canal. During the months of August and September, the old and young of almost every family, including physicians, were down with ague. I visited this locality several times during these months, and found the ague palmellæ growing abundantly on the partially desiccated, boggy soil, along the canal, through the town and vicinity, and found the morning expectoration of all more or less filled with the minute cells of these plants.

Numerous other localities were visited where intermittent fever prevailed, and in every instance, without a solitary exception, the ague plants were found growing in the immediate vicinity of the disease, and in no instance were they found when the disease did not occur.

An interesting instance of the readiness with which the emanations from



these ague palmellæ produce the disease, presented itself, the last of September, one mile west of the city of Lancaster. At this point, a few poles south of the pike, and about fifty poles west of Judge Van Tromp's residence, is a small pond, that affords water to a small flouring mill. During the months of August and September, the water became low in this pond, and the ague palmellæ made their appearance in abundance on the drying, peaty mud, from which the water had retired. From the time these plants appeared, till the last of September, the wind was in the south. There being no buildings on the north side of the pond, there was no appearance of the disease. Near the last of the month the weather became cool, the wind changed and blew briskly from the north and northwest. About thirty poles a little southeast of the pond, twenty-five to thirty feet above it, on the hillside, a strong, healthy, labouring family resided, who had been, up to this time, entirely free from ague. The wind blew over the pond directly towards this house. About the fourth day, several members of the family were taken down with the disease. The wind now suddenly changed to the southeast, blowing across the pond, directly towards the tollgate, about forty poles distant, where a family resided in which were four small children. This family had been, up to this time, also exempt from the disease. The third or fourth day, two cases of intermittent fever occurred among the children, and soon after the father was attacked.

Here is an interesting instance of the transmission of the malarial influence by the winds. These families had lived for nearly two months in the vicinity of an abundant crop of ague palmellæ, without taking the disease. The pond being small, banks abrupt, and soil around dry, no fogs or night vapours, to any extent, emanated from the place to diffuse the poison. What malarial matters there were emanating from this point, were borne north by the prevailing wind. As soon, however, as the wind changed, and blew over the pond towards the neighbouring abodes, the disease, in a few days, appeared.

A very interesting instance of the sudden occurrence of intermittent fever, at a point where it was never known before, occurred at the residence of Hon. John T. Brasee, one and a half miles west of the city of Lancaster, upon an elevated ground, about one hundred feet above the ague levels, and far removed from them. The locality has always been, from the first settlement of the country (sixty-five years), exempt from intermittent fever. The farm is abundantly supplied with fine large springs of pure freestone water, cold and soft. Near Mr. B.'s residence, one of these springs occurs. It had formerly supplied a small fishpond, containing about ten square rods of surface. This pond, several years ago, had been drained, and the rich alluvial bed had become covered thickly with grass. About five square rods of it were spaded up, for the first time, in the month of July, 1863, for celery and vines. Ague palmellæ began to appear on the freshly-spaded soil about August 1st. A portion of these were white, like those usually



met with, while others were of a brick-red colour, giving to the surface the appearance of having been sprinkled over with a thin layer of brickdust. Aug. 8th, Mr. Brasee and wife, who slept on the lower floor, began to feel languid, with loss of appetite, and pains in limbs and back. 20th, Mr. B. had his first chill, which came on about 12 o'clock (noon). The paroxysm lasted about three hours, and was very severe. 22d, Mrs. B. had her first paroxysm, which continued for about three hours, and was also very severe. 23d, the farm-hand and his wife were attacked. Mr. B.'s residence stands about ten rods north of this patch of ague ground, and his tenant's house about fifteen rods south of it.

August 22d, I examined the patch minutely. It was perfectly covered with ague palmellæ. Those growing on the dry prominences of the soil were white; those on the retired, smooth, and more damp portions, were the colour of brickdust. The whole surface had the appearance of having been sprinkled over with brickdust and lime. No cases of ague occurred in that portion of the family who slept up in the second story, nor were there any premonitory symptoms of that disease.

August 24th, the small ague patch was covered, at my suggestion, with a layer of straw, to the depth of six inches. On suspending glass plates over this for several nights, I obtained no trace of the palmelloid spores or plants, while before the straw was spread over the plants, the glass plates were covered nightly with them.

The four cases of ague readily yielded to treatment, with no subsequent manifestations of the disease. The straw, in this instance, prevented the further development of the ague palmellæ, and prevented the spores of the already mature vegetation from rising in the damp night vapours.

Another interesting instance came under my observation in the city of Columbus, Ohio. On a visit to this place, during the last of September, 1863, I met Mr. Theodore Tallmadge, who stated to me that his children were all being attacked with ague. He stated that his family had been spending a few weeks at White Sulphur Springs, and that about two weeks before, they had all returned home hearty and well. In a few days after their return, one of his children was attacked with ague, and soon after, another. This surprised him, as ague had not previously been known to occur at his residence. Feeling satisfied that there must be some local cause, I, on the following morning, repaired to his house and examined his grounds. I immediately discovered a prolific crop of ague palmellæ directly in the rear of his kitchen, in some new, peaty soil he had drawn there, a few weeks previously, to level off the surface. I directed him to sprinkle the surface of the new soil thickly over with caustic lime, after which he had no more cases of the disease in his family.

On the rich limestone lands of the Maumee and Miami Bottoms, in Ohio, the black, alluvial lands of the Wabash and its tributaries in Illinois and Indiana, the fertile prairie lands of these States, and Missouri and Iowa,



and on the rich, low, limestone, and alluvial lands of Kentucky, Tennessee, and Mississippi, ague palmellæ develop in great profusion, especially during the months of July, August, and September. For the most part, wherever the soil is free from lime, and the water soft, the ague palmellæ developed are mostly white, or slightly tinged with yellow and green, and intermittents are comparatively free from congestive tendencies, and the types better marked, the eliminating organs much less liable to become badly deranged, and the paroxysms more readily yield to the tonic influence of quinia and iron, and the disease is quite promptly and easily controlled, unless the system be exposed to the continued and constant action of the cause of the affection. In limestone regions, however, where the water is hard and the soil highly calcareous, there is a remarkable tendency, during the months of July, August, and September, for the malarious portions of the soil to become covered with palmellæ, mostly of a different colour from those found on soil not calcareous. On calcareous soil the palmellæ are usually pink, brick-red, greenish, or yellowish. The brick-red and greenish plants are the most abundant. In such localities, intermittents are apt to assume a congestive type, the functions of the eliminating organs (epidermic and mucous surfaces, and portal and renal glands) become much deranged and partially suppressed, oxaluric, and often phosphoric states follow, and, in this condition of the system, quinia, iron, and arsenic, alone or combined, do but little good, and often in old and bad cases, tend to aggravate the disease. If, however, in these severe forms, the functions of the eliminating organs be restored to their normal or to increased activity, by the proper diuretics, diaphoretics, expectorants, and alteratives, the paroxysms readily yield to the tonic and anti-zymotic influence of quinia and iron.

*College Hill, Nashville, Tennessee*, rises from 75 to 100 feet above the level of the Cumberland, which flows around its northern and eastern base. Upon its summit is an area of from six to ten acres. Here stands the University of Tennessee, and the residences of several of the faculty. When the Federal forces drove the Confederates from Nashville all of the high points or eminences, in and around the city, were fortified, for the better defence of the place. This hill was strengthened by a ditch six feet wide and four feet deep, with the excavated earth thrown on the outside, and running around on the eastern and southern brows which face the adjacent country. Soon after the University buildings were appropriated for hospital purposes. This high point was supposed to be peculiarly healthy from its elevated airy position, overlooking most of the city and surrounding country. As soon, however, as the warm weather of May and June set in it was found that this high ground was quite malarious, giving rise to a peculiar type of congestive intermittent that was very severe, producing in some instances death. The attendants were more subject to the disease than the inmates of the wards. This, probably, arose from the



fact that the former often exposed themselves to the evening vapours and exhalations outside, while the latter were mostly confined to the wards.

This peculiar type of intermittent became much more severe during the months of July, August, and September. The surgeon in charge, Dr. Lynde, was under the impression that this malarial influence came from the low ground to the east of the hill which bordered on the river, and which was half a mile distant and 100 feet below. This, on careful inquiry, was found to be highly improbable, as the malarial influence was much less marked on this low ground than on College Hill. On carefully examining the soil on the perpendicular sides of the ditch, which was dug to strengthen the place, it was found covered completely with cryptogamic vegetation, forming, in places, a greenish, and in others a brick-red film on the surface. Samples of this soil were preserved in boxes for microscopic examination. On my arrival at Cincinnati, three days after, this vegetation was carefully examined under the microscope, and found to be composed of green con-fervoid filaments and palmellæ, having mostly a pale green and a brick-red colour. The vegetation was very prolific and abundant. The palmellæ were of different species from those met with on non-calcareous soils, and were similar to those in districts where intermittents are of a congestive type.

Occasionally the soil on the hill, where it had not been disturbed, was covered slightly with this same vegetation. This was noticed all through the city and surrounding country wherever there were any indications of a malarious tendency. It was not, however, noticed in any great abundance, except where the fresh soil had been thrown up to a depth below where it had been usually disturbed in cultivation.

The city of Nashville stands on a series of small conical limestone eminences, which rise from 50 to 100 feet above the river. The limestone comes to the surface, or nearly so. This is so much the case that the rock is perfectly bare, and denuded of soil, over at least one-fourth of the surface, while the balance has a covering ranging from two inches to four feet in thickness. Wherever a cellar is dug it is sunk into the solid rock. The same may be said of all sub-drains and sewers. The limestone is usually either porous, shaly, or massive, and is rich in fossil remains.

The soil on College Hill is rather deeper than on most of the surrounding eminences, and the summit has a larger and more level area. The digging of this defensive ditch changed the health of the locality, so that now, instead of being the healthiest locality in and around Nashville, it has become decidedly the most malarious and sickly.

On the limestone soil surrounding *Louisville, Ky.*, and in *Jeffersonville*, opposite, similar species of palmellæ are developed upon the soil to those found at Nashville. All the low limestone lands in this region appear to be more or less malarious. Those just above Jeffersonville, where is erected the U. S. G. Hospital, on the Chestnut Hill plan, are very malarious. This site is on a low terrace, about 70 rods back from the



river, and rising about 20 feet above the river bottom. Immediately upon the brow of this terrace is located the hospital. The grounds had several sink holes, filled with stagnant water, which now have been filled up. Around the base of the terrace, springs, for nearly a mile in length, make out, forming a boggy, swampy strip of ground, from 10 to 20 rods wide. The south wind blows over this directly up to the hospital. It is made up of a black sandy muck, underlaid with stiff clay. This soil produces, during the months of July, August, and September, abundant crops of ague palmellæ. On this account the hospital is unfortunately located.

The low grounds around *Cincinnati* and *Covington*, during the months of July, August, and September, produce the ague palmellæ to some extent, and are malarious. Intermittent fever, often severe, is here met with.

*Camp Dennison*.—At this point is located the *Dennison* U. S. G. Hospital. It is about 16 miles from Cincinnati, on the Little Miami Bottoms, and about 25 feet above the river bed. The soil is calcareous, being underlaid with limestone. The hospital inclosure contains 180 acres of bottom land. Through it passes a shallow ravine, a drainage line from the adjacent hills to the river. The northern fifth of the grounds, previous to draining them in the spring of 1863, with open ditches, was damp, the surface water standing till evaporated, the natural surface drainage being very poor. The wards standing on this soil were found to be unhealthy, the inmates being very subject to intermittent fever. Since it was drained the wards have been empty. The soil over this portion of the grounds, wherever it is exposed by eve drains, ditches, &c., becomes, during the months of July, August, September, and October, covered with a green, cryptogamic vegetation, which, in places, becomes of an ink-black colour. This vegetation is composed mostly of confervoid filaments, which are frequently terminated when mature by sporangia. These sporangia are noticed when the vegetation has assumed an ink-black colour, with a metallic lustre. Mixed with these filaments are numerous palmelloid plants of two species, one green and the other brick-red. When mature these plants, as they become dry, send off multitudes of minute spores, which are elevated in the night exhalations.

There is also met with on calcareous soils another species, of a metallic lead colour by reflected light. By transmitted light they have a dirty, brownish-green colour.<sup>1</sup>

<sup>1</sup> It may be here remarked that *Palmellæ* belong to the lowest known vegetable organisms. The several forms of this type which are constantly attendant on intermittent malarial disease have received the generic name *Gemiasma* (earth miasm).

*Gemiasma* (Salisbury). Plants having the appearance of cells, each consisting of a thin outside wall, inclosing an inside cell filled with minute spores, either single or aggregated, multiply by duplicative, segmentative within a parent mem-



So far as I have examined (and my observations have been widely extended), I never have found a case of ague, *in situ*, where I did not find brane, and also developed from spores. Colours various, as red, green, yellow, white, plumbeous, &c.

There are several species which seem to act as malarial poisons. The brick-red, green, and plumbeous plants are principally found upon rich calcareous soils; while the greenish-yellow and white varieties are found mostly upon non-calcareous ground.

*G. rubrum* (Salisbury). Colour, brick-red. Gives the soil the appearance of having been sprinkled over with brickdust. Produces intermittents of a congestive type.

*G. verdans* (Salisbury). Colour, green.

*G. paludis* (Salisbury). Colour, greenish-yellow. Found mostly on non-calcareous soils. *sd*

*G. plumbous* (Salisbury). Colour, plumbous by reflected, and a dirty brownish-green by transmitted light.

*G. alba* (Salisbury). Colour, greenish or yellowish-white.

In all these species the mass of the visible dust, or incrustation upon the soil, is usually made up of incalculable multitudes of minute spores that have escaped from the plants beneath them. These most minute of all known organic cells are the organisms that are elevated in the night earth exhalations.

Another type consists of jelly-like protuberances, single or in groups, made up of a thin external membrane inclosing a highly transparent, gelatinous material filled with minute double walled spores. This type has received the generic name *Protuberans*.

*Protuberans* (Salisbury). (Ag. gave this name to a species.)

In these the double walled spores are developed in a highly transparent jelly-like frond, surrounded by a delicate membrane. These are various shades of green, yellow, brown, and, perhaps, other colours.

Another type of plants seem to multiply by the extending laterally of a thin lamina or gelatinous layer, which, like the protuberant variety, consists of an outside parent membrane, within which is a gelatinous matter, filled with a multitude of minute double walled spores, which escape in vast numbers as the lamina dries. This type has received the generic name *Lamella* (Salisbury).

All these genera have spores of a similar structure. The spores are mostly oval, or more or less oblong, and have double walls. The spores of the *Protuberans* are larger than those of the other genera, and the space between the nucleus and outside cell-wall is more marked.

In the *Palmellæ* there are two modes of propagation, one by division and the other by spores, and both of these are often common in the same species. These plants are very prolific, springing into existence in a few days in vast multitudes, during the hot summer months, on the drying beds of ponds, stagnant pools and ditches, on the broken soil of humid low grounds, and new prairie lands in malarious districts.

The species are many, all of which have heretofore been regarded as innocuous. There is strong evidence for believing, however, that the minute species that are developed in such abundance in the above-named localities, and the spores of which become elevated and suspended in such multitudes, in the heavy humid night exhalations of ague districts, are decidedly poisonous to the epithelial surfaces with which they come in contact, and are the true source of intermittent and remittent fevers.



these plants growing near; and *vice versa*, I never have found these plants growing in any locality but that (if such locality was inhabited) intermittent or remittent fever, or both, prevailed in proportion to their extent and profusion.

As early as the dry warm weather of spring and summer evaporates the surface water, and begins to dry off the recently exposed soil of rich humid low grounds and peaty bogs in certain localities; a peculiar white, green, or yellowish, or greenish-white, or brickdust powder, will be noticed making its appearance upon the surface. This is thicker in such places as have been recently broken, exposing fresh earth. It also varies considerably in appearance, according to age, rapidity of surface drying, and peculiarity of soil. It is not confined to desiccating peaty bogs and humid low grounds, but is common to the drying beds of streams, pools, ponds, and ditches, and also to calcareous soils, and even sandy plains in humid localities.

On the drying of the newly exposed soil of rich prairie lands and humid low grounds, this vegetation appears white and much thinner than on desiccating peaty bogs. This difference arises from the development on the latter of some larger species than grow upon the former, while the small species of the former are common to the latter. These plants occupy the projecting points and prominences of the soil, and resemble to the unaided eye, an incrustation of saline matter. During the drying of the soil, these plants develop rapidly, and as rapidly disintegrate and set at liberty their spores, which become elevated and suspended in the damp, heavy night exhalations. These exhalations, suspending their palmelloid cells and spores, rise, usually, so that their upper surface in the Northern and Western States, is marked by a plane varying from thirty-five to sixty feet above the surface of the ague grounds. The upper surface of these exhalations describes a horizontal plane, stretching away from the place of origin, in the direction traced by the wind. The spores and cells of these palmellæ are found diffused throughout these vapours, but do not extend above them. They occur, however, more abundantly at and near their upper surface, than lower down. This will explain the singular fact often noticed, that at a certain distance above the ague bottom, along the side hill, malarious diseases are frequently worse than on the bottoms themselves. The zone occupied by these exhalations has a temperature and hygrometric condition of its own; differing materially from the stratum of atmosphere resting immediately upon it, which is much warmer and dryer.

*Plants in the Urine of Ague, which act as an Exciting Cause.*—The urine of several hundred cases of intermittent and remittent fever has been subjected to careful microscopic examination, with the view of arriving at general results, as to the abnormal bodies present. The urine was in some cases voided before treatment had commenced; in others, after treatment had been continued for some days, without breaking the paroxysms; and



in others the paroxysms had been broken for the time with quinia, while the fever poison still remained in the system. The urine was voided, either in the algid, febrile, or sweating stage of the disease; between the paroxysms, or after the paroxysms had ceased for some days. The results of these examinations are highly interesting. They establish the fact that ague plants, the same as grown upon the ague soil, are constantly developing in the system of the intermittent fever patient; and that the urinary organs constitute one important outlet for the elimination of this fever vegetation. That the urinary organs, with the perspiratory apparatus, are the important channels through which nature strives to rid the organism of the exciting cause, and through which the physician should operate by all the medicinal means at his disposal, to eradicate the disease. They explain to us the important reason, why it is that quinia breaks the continued recurrence of the paroxysms, while it does not eradicate the poison; and why diuretics and diaphoretics and expectorants are such all important aids in eliminating from the system the malarial cryptogams. While quinia braces up the system by its powerful tonic action upon the organizing processes of the epithelial tissue, and through this imparts such tonicity to the nervous system as to enable it to resist the paroxysms, it is well known not to exterminate the exciting cause; although it may control for a time their further development, in the same way that it checks the multiplication of yeast plants in fermentation.

This exciting cause must be carried out of the organism through those excretory channels which nature has provided for the elimination of effete and abnormal products. The principal of these are the perspiratory apparatus, the mucous surfaces and urinary organs. That the perspiratory apparatus performs in this disease an important office, in this eliminating process, we should long ago have understood, from the fact that through this excretory system nature so powerfully acts in her efforts to eliminate the abnormal and poisonous products of the disease. The sweating stage of the paroxysm of ague is essentially a curative one.

These examinations have also established the fact, that in intermittent fever conditions, torula cells are present, indicating the presence of glycogenic matter in the urine. Cholesterine is also uniformly present in this excretion in ague. Both glycogenic matter and cholesterine are found in the liver and spleen. The spleen is the great manufactory of cholesterine,<sup>1</sup> and at the same time organizes some glycogenic matter, as is evident from the development of torula cells in the spleen, when it is removed from the body and allowed to ferment.<sup>2</sup> The liver is the great apparatus for organizing glycogenic matter. The kidneys never normally organize or excrete these bodies. In intermittent fever, we see then, that the functions

<sup>1</sup> See my papers on the Minute Structure and Functions of the Liver and Spleen.

<sup>2</sup> Ibid.



of the liver and spleen, of secreting glycogenic matter and cholesterine, are in part taken on by the kidneys; indicating, perhaps, something like a metastasis of function; and pointing us to these organs for disturbances that are excited by the cryptogamic poison of ague.

There is also found quite uniformly in the urine the spores of a species of fungus—generally vegetating—belonging to the genus *Sphærotheca*; and which is uniformly found growing on and in the larger species of palmellæ, belonging to the genus *Protuberans*, and also in the apple, pear, and quince, producing decay in these fruits. I do not know that this plant produces any abnormal influence upon the system, as it is often met with in the urine of healthy persons.

The ague plants occur in the urine in the form of little cottony flocks, so small that they are scarcely noticeable by the unaided eye, and too few in number to communicate turbidity to the excretion. They vary greatly in amount present in different cases. They are uniformly more abundant when the disease is severe and has continued for some time. They are very light in colour, highly transparent, and appear to be developed in the bladder, pelves of kidneys and ureters, often in considerable numbers. In some cases of ague of long standing, yeast plants, species of *Pennicillium* and *Aspergillus* are also found, developing in large numbers, the mycelia often rising to the surface, a short time after the urine is voided, producing fertile threads and fruit. These plants were found largely developing in the urine of several patients, in the month of September, who had been labouring under the disease most of the summer. In several instances of this kind, I have known the intermittent to merge, after some weeks, into continued fever of a typhoid type. In all cases of this kind, the patients had been receiving constant accessions to the disease, by being exposed daily to the exciting cause.

*Plants in the Urine of Intermittent Fever, Consequent on Peculiar Pathological States.*—In the urine of all cases of intermittent fever, the spores of *Pennicillia* are present, indicating the presence of glycogenic matter undergoing fermentative changes. These cells are generally more abundant in obstinate types, and in cases of long standing, than in the milder forms and recent cases.

In several instances, in observations, where the patients had been labouring under severe and obstinate forms of the disease (such as were exposed to constant accessions) for many weeks, tending to typhoid states of the system, the urine was found containing numerous vegetating fungoid filaments, which were the developing Mycelia of *Pennicillia*, *Aspergilli*, or *Sphærotheci*. In these obstinate cases of the disease, the urine passes rapidly to the acetous fermentation even before it is voided, ushering in filamentous development in the cryptogams present. This fermentation progresses so rapidly, that in a few hours after the urine is voided, putrefactive fermentation begins, and small white cottony flocks or tufts of fertile



threads appear above the surface. These soon bear spores, when the plants are discovered to belong either to the genus *Pennicillium*, *Aspergillus*, or *Sphærotheca*.

There is a beautiful species of *Pennicillium* often present, having symmetrical heads, the stem dividing first into four equal pedicels, which ascend close to each other, and soon subdivide each into four pedicelets, each one of which bears a long moniliform line of spherical spores. I do not know that these cryptogams are at all injurious of themselves in the urine; but they indicate the presence of glycogenic matter and rapid fermentative changes, which are abnormal. They are probably merely the consequences and not the cause of the existing pathological states.

*Experiments Relative to the Production of Intermittent Fever.*— With the view of obtaining still more positive evidence of the intimate relation between the cause of intermittent fever and the cryptogam developing upon drying humid soils, &c., I filled six tin boxes with the surface earth from a decidedly malarious drying prairie bog, which was covered completely with the palmellæ previously described. Cakes of the surface soil were cut out, the size and depth of the boxes, and fitted carefully in, without disturbing more than possible the surface vegetation. The covers were then placed on, and the boxes transported to a high, hilly district, some five miles distant from any malarious locality, and where a case of ague had never been known to occur. The locality was over three hundred feet above the stream levels, was dry, sandy, and rocky. I here placed the boxes of cryptogams on the sill of an open second-story window, opening into the sleeping apartment of two young men; removed the covers and gave particular directions that the boxes should not be disturbed, and the window left open. On suspending a plate of glass over the boxes on the fourth day, during the night, the under surface of the plate, the following morning, was found covered with palmelloid spores, and numerous cells of the same kind adhered to a suspended plate in the room, which was moistened with a concentrated solution of chloride of calcium.

On the twelfth day one of the young men had a well-marked paroxysm of ague, and on the fourteenth the other was taken down with the disease. They both began to feel unnatural and dull about the sixth day. All three stages of the paroxysms were well marked. The type in both cases was tertian, and was readily controlled by the appropriate remedies.

Four members of the family slept on the lower floor of the house, but none of them were affected.

The experiment was repeated at another point, in the same neighbourhood, where one young man and two boys were exposed in the same way as described in the previous case. In this instance, the two boys were taken down with the disease; one on the tenth and the other on the thirteenth day of the exposure; while the young man escaped.



On account of other duties, and the difficulty of obtaining the consent of parties for experiments, I have been unable to conduct this part of the examination further. The experiments thus far, however, are most highly interesting and confirmatory of the previous observations and results of this extended inquiry, on which nearly three years of almost constant labour have been bestowed.<sup>1</sup>

*Pathology of Intermittent Fever.*—The lesions in intermittent fever are confined mostly to epithelial structures, showing quite conclusively that the exciting cause acts primarily upon the parent epithelial cells; or, those cells that either organize the products that nourish the several tissues, or disorganize those of interstitial decay, so as to prepare them for ready elimination.

These derangements consist in the altering and enlarging of glandular structures, and in inflammations and alterations in structure and function of the mucous, epidermic, and serous surfaces. All other abnormal manifestations are either symptomatic of these, or are the result of previous disease in the organism.

All the glands in the body belong, strictly, to epithelial tissue, and are made up mostly of parent epithelial cells. These structures are affected in time and extent apparently in proportion to their importance in either organizing and assimilating products for nutrition, or disorganizing those for elimination.

Of all the lesions met with in fatal cases, those of the spleen and liver—most important organs of the body—are the most frequent. The spleen increases in bulk and consistence; its structure is easily torn; its interior often being found to be broken down, and composed of a blackish-red pulpy mass, with which are mingled fibrinous portions of a lighter colour.

Morgagni gives one case where the spleen weighed eight pounds; and another is mentioned by Bailly that weighed nearly ten pounds, the structure being entirely converted into a pulp. The spleen has been occasionally ruptured, and the broken-down and altered tissue emptied into the abdominal cavity. This indicates an altered condition in the organizing processes of the parent epithelial cells of the organism, by which the fibrinous matters and other products of the blood formed, become deposited in the splenic tissue, thus producing enlargement (so-called ague cake) which often, if the patient is not removed from constant accessions to the disease,

<sup>1</sup> Another interesting instance of the production of ague paroxysms by this vegetation, occurred since this paper was partially in type. After exhibiting, about the first of November, a large pan of soil, covered with this vegetation, to the class in one of my lectures, I placed it under the working-table in Dr. House's office. It was loosely covered with a newspaper, and forgotten. In a few days the doctor began to have pains in the back and limbs. These symptoms were soon followed by a well-marked paroxysm of ague. As soon as this occurred the pan of plants came to mind and was removed.



and the exciting cause not eliminated from the organism, results sooner or later in disorganization, and frequently in disintegration of the gland. The liver is also in some cases found greatly enlarged, but altered but little in structure. In others it is softened or filled with black blood, or tuberculated, or containing purulent deposits.

The pancreas is also frequently hardened, so as almost to resemble scirrhus. The mucous membrane of the stomach, duodenum, and small intestines are likewise sometimes involved.

The mesenteric glands are frequently enlarged, and are subject to very nearly the same derangements in function and structure as the spleen.

The exciting cause, inhaled, taken into the system in food and drinks, and absorbed by the skin and mucous surfaces, comes in direct contact with the epithelial cells, spread over and covering the entire body, both internally and externally, wherever there are any ways by which external bodies may enter the organism. The epithelial cells, hence, make up the first tissue of the system with which these poisonous bodies come in contact. These cells they have to pass through before they can enter the systematic circulation and reach the vascular tissues. In passing through these cells, they derange them so as to poison the products they organize. In this way the other tissues, including the ganglionic and cerebro-spinal systems, become involved. As the epithelial cells of the glands, especially those of the spleen, mesentery, and liver, are the most largely engaged of any in organizing nutrient products for the other tissues, these glands are the most severely taxed, and are the first to suffer extensively from the poisonous palmellæ, and hence it is that in these we find so frequently grave lesions.

When the tissues have become poisoned to a certain extent, there is a reaction on the part of the system, an effort of nature to eliminate the poisonous products already in the body. This effort is the paroxysm, which constitutes what we call the disease.

We can readily see how it is that the blood of the body should become thin (deficient in fibrin) as soon as the functions of the spleen are partially or wholly suspended. This being the gland which organizes fibrin more largely than any other, if its function in this respect be suspended by the blocking up of the *oval splenic bodies* with partially organized fibrin, one great source of this product would be cut off from the blood. The fibrin already in the blood becomes deposited in the tissues, and one important source being cut off, the blood becomes thin and deficient in this body. This thin blood fills up all portions of the organ not occupied by masses of fibrin, and hence the ease with which the blood contents of the spleen may be washed out. Whenever the whole mass of the blood of the body becomes very abnormally thin, we may look to the spleen for the primary lesion.

Some of the interesting symptoms of intermittent fever, where the spleen



is involved, Dr. Tweedie says, are "depression of spirits, torpor of mind, inactivity of body, with much muscular debility, deadly paleness, or a yellowish hue tending more to black or green than in ordinary hepatic disease. There is great liability to hemorrhage from various regions of the body, to dropsy, to dysentery, and to ulcers of the legs. The spleen is liable to take on a morbid condition in continued fevers, as well as in intermittents. Diseases of the heart, stomach, and liver, are liable to be accompanied by diseases of the spleen. The spleen is more liable to be affected with disease in damp, marshy localities than in other situations. In intermittent fevers there is a diminution of red globules and fibrin. Softening and the breaking down of the spleen are common in intermittent and continued fevers, in scurvy, and in some varieties of malignant dysentery."

By understanding the true functions of the spleen, these symptoms and lesions are all traceable to their true cause.

Depression of spirits and torpor of mind may arise from either oxaluric or phosphatic states, or from a defective or suppressed organization of some of the nutrient products of nerve tissue; inactivity of body and muscular debility, from a deficient supply of fibrin to muscular tissue; the yellowish hue, to a defective supply of red globules; the great liability to hemorrhage in different parts of the body, dropsy, and dysentery, to thinness of the blood, and the defective supply to it of its normal products.

The probable reason why the spleen is so liable to take on a morbid condition in continued fevers as well as in intermittents, is that the exciting causes of both affect primarily the epithelial tissue, and have a tendency to derange those portions most which are the most actively engaged in organizing nutrient products, the reason of which appears to be that the exciting causes exist alike in the materials we eat, drink, inhale, and absorb through the skin.

The reason why the spleen is more liable to be affected in damp, marshy localities than in other situations, is, that in the former districts, miasmatic poisons impregnate more or less the air, the water, and the food.

The reason of the diminution of fibrin and red globules in the blood in intermittent fever is the greater or less suppression of the normal functions of the spleen and mesenteric glands.

*Treatment.*—Since nature in the last stage of the paroxysm excites all the excretory organs of the body, and especially the perspiratory, urinary, and mucous surfaces generally; and as these excretions contain spores and plants of the ague palmellæ, it is evident that the sweating stage is a curative process. If so, it points us to important medicinal means as aids in eradicating the poison. These are diuretics, diaphoretics, expectorants, and alteratives. While we should keep quinia constantly in the front rank to impart tonicity to the ganglionic and cerebro-spinal systems and to the epithelial tissue and to control in the body cryptogamic development, we should use diaphoretics, diuretics, and expectorants freely as eliminators.



The nightly sweating of a patient labouring under this disease, might be supposed to result in enervating the system. The reverse, however, is the case. Under active nightly diuresis and diaphoresis, in ague, the sallow countenance rapidly clears up; the dull eye becomes bright; the depression of spirits and torpor of mind and body disappear, and give place to the elastic step and tonicity of muscle. The result is, that, even when the system is exposed to constant accessions, the paroxysms are not only avoided, but organic lesions, and the long train of unpleasant symptoms are not allowed to get their hold upon the system, the ague poison being eliminated as fast as taken into the organism.

In cases where the patient is removed from the exciting cause, the system is soon thoroughly cleansed, and no ague returns the following spring unless there are new exposures.

The power of the system to resist the paroxysms of ague varies greatly in different individuals, and even in the same individual at different periods. This power of resistance is directly proportioned to the tonicity of the system. Habits of bracing, active exercise, such as horseback riding, will often protect the system against attacks. This is noticed in a marked degree in the cavalry and infantry service of the army. In malarious localities, the former are seldom attacked, if on active duty, with intermittent fever; while the latter are extremely liable to suffer. This is the case when both branches of the service are occupying the same malarious district, and are equally exposed.

*Quinia*, as a prophylactic, enables the system to resist the paroxysms. It braces up the system, and controls cryptogamic growth till nature can effect a cure by eliminating the malarious cause through the skin, mucous surfaces, and kidneys. *Quinia*, then, is not, strictly speaking, a curative or specific agent, but simply acts beneficially by controlling cryptogamic development, and imparting such tonicity to the organism as enables it to resist the paroxysms, till aided nature can cure the disease by eliminating the cause. Any cause that enervates the system in malarious regions, tends to bring on the paroxysms earlier than they otherwise would appear. Very frequently it is noticed, especially when the system has been under the influence of the disease for some time, and most especially if the disease is contracted in a region where there is a tendency to congestive paroxysms (limestone regions especially) as in the southern part of Tennessee, in Mississippi, and Louisiana, *quinia* appears at first to have some influence in enabling the system to resist the paroxysms, but soon loses almost entirely its power. In fact, in many instances, it really aggravates the paroxysms, as is evidenced by stopping the *quinia* entirely. In such cases the skin will be found dry, the mucous surfaces less active than normal, and covered with a scant, clammy mucous secretion, and the renal excretion small; in fact, all the eliminating organs have their functions deranged and their normal action partially suppressed. As long as these are in this condition, the



malarious poison is hemmed up in the organism, so much poisoning the tissues, that the tonic influence of the quinia rather tends to aid, frequently, the abnormal actions than to restore the normal tone. If, however, the normal functions of the kidneys, skin, and mucous surfaces are restored, with diuretics, diaphoretics, and expectorants, and the spleen and liver properly attended to, quinia again will act beneficially and impart its usual tonic effects and the disease will soon be eradicated, especially if the patient be removed from constant accessions.

It is highly important to constantly endeavour to keep the eliminating organs in a healthy and rather increased state of action, when the system is under the influence of any malarious poison, as it is through these channels that the causes are eliminated. We have, then, in this disease, no such thing as a specific in *quinia*. It simply imparts tonicity to the system, and controls cryptogamic development, till Nature, aided by remedial means for exciting the excretions, is able to eliminate the poison.

These principles should be strongly impressed upon the mind of the physician who has charge of malarious diseases. Many old and obstinate cases of ague, with the system filled with the malarious poison, and all the channels of egress closed, are being daily dosed largely with quinia, arsenic, and iron, with little or no effect, with the view of curing the disease in some empirical and mysterious way by these so-called *specifics*. The very name *specific* should be blotted from medical science, and left entirely to the *quack*, who knows nothing else. There is really no such thing in medicine. All we can do in any disease is to aid Nature, and to follow her as closely as possible in her curative processes, and this we can only do wisely and well, by understanding fully the true cause and pathology of every disease we treat.

In treating intermittent fever, it is of the first importance to correct any abnormal condition of the portal system, and to accompany this by diuretic, diaphoretic, and expectorant remedies, to excite into activity all the eliminating organs of the body. It is impossible to mark out a fixed course for all cases. The following prescriptions will, however, illustrate the general plan of treatment:—

R.—Potass. acetat.  $\mathfrak{z}$ ij; spts. nitr. dulcis  $\mathfrak{z}$ j; syr. scill. comp.  $\mathfrak{z}$ ss; aquæ menth. pip.  $\mathfrak{z}$ viiij.—M. S. Take from one to two tablespoonfuls, in a glass of water, morning, noon, and night. Every evening, on retiring, take a warm diaphoretic draught.

Also, R.—Quiniæ sulph. gr. xxxij; strychniæ sulph. gr.  $\frac{1}{4}$ ; mass hydr. gr. vj; pulvis capsici gr. xx; ferri lactat. gr. xx; ext. gentian. syrup. āā q. s.—Make pills xxxii. S. Take two pills every two hours till sixteen are taken. Every day or every other day after, according to the type of the disease, take four pills two hours before the time for the paroxysm. At the end of ten days, take two pills every two hours till sixteen pills are taken, and continue as before for ten days more, then take



sixteen more pills. By this time, if the eliminating remedies are kept faithfully up, the patient will be thoroughly cured, if he is not exposed to constant accessions. If he is, the eliminating organs must be constantly kept excited, that the cause may be removed as fast as it enters.

Under this treatment a paroxysm need never occur after the commencement of the remedies.

The means are within our reach for *removing the prolific cause* of intermittents. Rich, humid, low grounds, which produce ague plants abundantly when they are new, undergo some change by culture and drainage, that unfit them for the growth of the palmellæ. As the malarious portions of the country become older, and the low, humid, rich grounds become drained and cultivated, ague districts will become more and more circumscribed, and intermittents proportionally decrease. As long, however, as there remain in such localities, pools, ponds, ditches, and streams, the beds of which are liable to become more or less dry during the warm summer months, intermittents may be expected, to a certain extent, to prevail. These sources of the disease, however, may be much lessened by turning the open ditches into blind ones, draining pools, swamps, and ponds, and subjecting the soil of their beds to repeated cultivation. By this process, intermittents, which now extensively prevail over a large portion of our richest districts, may be so circumscribed in their limits as to be no longer a dreaded accompaniment to the most fertile agricultural sections of our country.

Where it is necessary to make excavations, during the warm, dry months, in new, rich, humid soil, the bottoms and sides of these excavations, with the earth removed, should, at the close of each day's work, be plentifully sprinkled over with caustic lime. If this precaution be well attended to, the ague plants will not develop. It is also highly desirable, in making ditches through malarious soil, to keep the bottom, sides, and thrown-out earth well sprinkled with lime.

As fast as the beds of streams, ditches, pools, and ponds, in ague districts, become dry, they should also be well strewn with caustic lime. This is especially desirable, in this climate, during the months of July, August, and September.

When new prairie land, or new, humid, low ground, is being turned up for the first time, and lime can be readily obtained, it will save much sickness by sowing it over with a good top dressing of caustic lime. If one application is not sufficient to check the growth of ague plants entirely, a second should be made. This application will by no means be lost on the soil, as it serves to neutralize acidity, convert resinous matters into soluble soaps; and the soil is thereby rendered more fertile, and that its increased and better crops will more than pay for the lime application. If lime cannot be obtained, wood-ashes may be used, though their effect will not be as marked or enduring. In selecting camping-grounds for armies, or locations for



hospitals, new soil and low prairie, or other humid grounds, should be avoided as much as possible. Wherever open ditches are made, streets excavated, wells and cellars dug, or new earth thrown up or exposed in any way to the drying influence of the sun and atmosphere of May, June, July, August, and September, and especially during the two latter months, if the region is at all malarious, caustic lime should be freely strewn over all such excavations, and over the heaps of soil removed.

*Influence upon the System of the Pollen and Volatile Principles of Phænogams when inhaled.*—The spores and exhalations of cryptogams are not the only bodies in the atmosphere that excite, when inhaled, abnormal and diseased conditions. During the active flowering of phænogams, the air becomes loaded in their vicinity with the pollen of the flowers, and volatile principles of the plants. These matters are inhaled in large quantity by those breathing the atmosphere containing them. If the plants produce no innocuous or active medicinal principle, the pollen and exhalations, except in particular instances hereafter referred to, have no abnormal influence upon the organism. But if they produce poisonous products, or active medicinal agents, the influence of the pollen and volatile principles inhaled is readily felt.

In passing through or past a field of hops, lettuce, or poppies, in flower, a sensation of drowsiness is soon felt, accompanied often by lassitude and indisposition, either to mental or physical action. In passing through a field of stramonium in bloom, or tobacco, similar sensations follow, with nausea, weakness, a tired sensation about the eyes, followed by pains in the head, &c. In passing among the plants of conium maculatum in flower, drowsiness, with a stiffness of the eyes, followed by swelling of the orbital tissues, and a dull pain in the eyeballs and forehead are the result. These symptoms vary much in severity and duration, according to the time the system is under the influence of the deleterious agents, and the quantity inhaled and absorbed by the surface.

In passing among poison ivy (*Rhus vernix*) when it is in flower, the effects are often so powerful, especially when the air is damp, and during the night, as to produce extensive œdematous swelling and inflammation resembling erysipelas. The pollen of several species of lobelia excite nausea and giddiness. There are many other plants that possess powerful medicinal and poisonous agents, growing in our forests and upon our prairies, the pollen and volatile principles of which, when inhaled, produce marked derangements.

Many exotics of the greenhouse come also under this head. The flowers of all such plants should be avoided as much as possible. Many of those unpleasant sensations experienced by travellers and explorers in a new country, while passing among luxuriant plants and beautiful flowers, arise from the inhalation of the pollen and volatile principles of this vegetation.



No doubt many diseased conditions may have their origin in such exposures.

Dr. Isaac Hays, editor of the *American Journal of the Medical Sciences*, detailed to me, a short time since, some most interesting instances, that had fallen under his observation, of the influence of the pollen of the rose, and also several cases of the influence of the pollen of, and exhalations from, the cereals and other phænogams upon particular persons.

The exhalations from certain plants, when not in flower, produce, on some persons, marked effects. As an instance of this, the poison ivy (*Rhus vernix*) may be mentioned as producing violent symptoms of poisoning, in certain cases, without ever coming in contact with the plant. Such susceptible persons are able to distinguish its presence before they are able to see the plant, by the effect of the air upon them.

Some are highly susceptible to ipecac, it producing peculiar symptoms upon them by simply being in the room with it. Calomel will also frequently excite temporary salivation and nausea in some by simply handling it.

Numerous other instances might be added to those already briefly referred to, to show the effects, upon either some or all systems, of extremely minute portions of certain bodies when inhaled. It indicates to us the probability that the atmosphere may contain many of those subtle causes of disease, which have thus far eluded the search of so many long and patient inquirers.

In conclusion, I may state that this paper presents merely a brief of the investigations in this direction. All the microscopic descriptions, with six plates of illustrations, and many detailed observations and experiments, are omitted, on account of the whole being too long for an article in a medical journal.

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ART. III.—*An Inquiry into the Causes of Certain Diseases on Ships of War.* By EDGAR HOLDEN, M. D., late Assistant Surgeon U. S. Navy. Read before the Essex Medical Union, of Newark, N. J., and published by request of the Society.

It is not designed in this article even to touch upon the interminable discussions regarding the construction, regulation, and climatic liabilities which may, upon ships in general, act as causes of disease, or to discuss, so far as it is possible to avoid it, those common well-known diseases peculiar to men congregated in restricted quarters, but to review briefly and present as concisely as possible, *three* maladies most prominent upon our national vessels and on our own coast during the past four years. Even



the scorbutic element must be excluded from the list. Once the scourge of the navy, this latter disease has become less the enemy of the sailor than the soldier, and the unlimited supply of vegetables in a canned, or desiccated state, and prophylactics, of medicinal renown, in various forms have rendered the disease comparatively infrequent.

Indeed, it is a fact worthy of remark, and one reflecting credit upon the profession, that the list of diseases peculiar to shipboard has become exceedingly small, and to-day there is, perhaps, no place where men are associated together where more scrupulous regard is paid to cleanliness and comfort, or better general health prevails than on the vessels of war of the American Navy.

The first and somewhat prominent point to which I would at present allude is the influence of hydro-sulphuric acid.

For a long time this intensely fetid gas, generated in the bilges of ships, was regarded as the chief agent in the production of disease, yet its precise origin and the particular nature of its influence were not generally understood. It was well known that decomposition of vegetable matter together with a moist and long confined atmosphere, were concerned in its generation, but its effects when medicinally administered, *i. e.*, inhaled, or taken in saturated watery solution, were insufficient to explain the phenomena so generally ascribed to it. That we may ascertain its precise influence, and whether, indeed, it is at all instrumental in the production of ship diseases, it may not be out of place to inquire into its general and toxic properties.

The bilge of a ship being the lowest part of the hull, there is always a gradual accumulation of water from the frequent washings of the lower decks and the slight leaks in various parts of the frame. With this water goes down, of course, more or less vegetable and animal matter readily decomposable in the closely confined air. After the ship has lain long at anchor in smooth water or in port, and becomes subject to the motion of the waves, the gas in question is forced up through every crevice, and might now be supposed to produce, if at all, its deleterious effects. On the contrary, however, it meets at its very exit an enemy more subtle than itself in the peroxide of hydrogen, which, under the name of ozone, is supposed to give so bracing a character to the sea-air; and also in the free chlorine, which to a slight extent exists, and which most rapidly decomposes it. However concentrated the acid may have become, and even when the air seems completely saturated, as it does when the pumps are called in play and the filthy blackened water is allowed to run over the deck to the scuppers, its effect is hardly perceptible.

Occasionally, after the bilge has been long neglected, a prevalence of headache and transient lassitude may be noticed, but seldom to such extent as to require treatment or suggest a single fear of actual disease. Even in the case of sailing ships, where it becomes necessary to use drinking water



impregnated with the acid, the effects seem not to be those that we well know are peculiar to the ordinary exhibition of it in solution, as lassitude, nausea, and, in extreme cases, convulsions and loss of sensibilities, but rather those arising from the actual bodily presence of decomposing organized matter, belonging to the stagnant water itself, such as eruptions, diarrhoea, etc.

The gas, as usually encountered on shipboard, is not then responsible in itself for the diseases ascribed to it. Yet I am convinced that there is a way in which it is responsible for certain diseases, and for this reason the subject is introduced into the present article. I refer to its agency in connection with various species of cryptogamæ in production of miasma.

It is with considerable diffidence that I endeavour to present the result of my observations on a subject so hackneyed, so familiar, yet so little understood.

It would be as uninteresting as useless to enter upon the various theories that have, from time to time, been advanced regarding the atmospheric condition or peculiar poison upon which malaria depends, nor is it at all necessary to the present purpose.

That it is essentially organic, and that heat, moisture, and attendant decomposition are instrumental in loading the air with the deleterious particles has become too universally the opinion to require more than passing allusion. Observation of the following accidental phenomena has led me to the belief that in many or most instances on shipboard the poisonous substance in question depends not only on the floating spores of a species of cryptogamia, as is usually believed, but that the particular species is the division known as Thallophyte, that they are inert to a great degree, perhaps entirely of themselves, but that in the presence of sulphuretted hydrogen they will generate miasm and produce disease.

I dare not presume to enter into an elaborate discussion upon so comprehensive a subject, or to present the phenomena referred to as by any means conclusive, since they are far too limited and not followed, as they should have been had circumstances permitted, by closer investigation and more varied experiment. As crude observations merely they are presented, and even as such may not be devoid of interest.

It was the month of March; we had been ten days at sea, and were distant N. E. from the Bermudas about one hundred miles; the crew in good condition; a remarkable degree of health prevailing; and being on an independent cruise for blockade runners, of course all were in excellent spirits.

Before starting out from Norfolk Navy Yard it should be premised the storerooms and holds of the ship had been thoroughly aired and dried, the magazines fore and aft having been under repair.

As soon, however, as the ship began to feel the motion of the waves the fetid gas from the neglected bilge was forced up in quantity, and with per-



sistency almost intolerable. For several days the paintwork of wardroom and steerage showed its influence by an increasing darkness, and this, for some time after we had ceased to consider it even an annoyance. In spite of frequent openings of the hold beneath the wardroom, where our daily provisions were stored, no one appeared to suffer any uneasiness approaching disease. There came occasion to send to the storeroom where were kept my surplus medical stores and liquors. The door of this room opened into the hold. The man, upon presenting the articles for which he was sent, stated that everything was getting mouldy from having the door closed. That afternoon he was seized with a severe chill, eventuating in a fever of intermittent type, the first case on the ship since going into commission. Without noticing any connection between the visit and the disease, one of the wardroom servants was sent down on the following morning. That evening he, too, was attacked. Still not seeing any similarity in the cases, yet wondering to find it under such circumstances, and so far at sea, the matter rested.

One or two visited the same storerooms for some purpose during the ensuing day, but no disease followed.

A few days afterward the paymaster sent his steward to open an adjoining storeroom where was kept new clothing for the crew.

He too spoke of the mould, yet by no means as an unusual occurrence, since it is not uncommon in a closed storeroom so near the bilge. During the following day he was seized with intermittent fever. Now for the first time the similarity in the cases was noticed, and when the paymaster's clerk had been seized under precisely the same circumstances the hold in question was looked to as the point of origin of the miasm. Yet every day one or another visited the adjoining provision room in the same hold, which, however, had never been closed for more than twenty-four consecutive hours, and all continued well.

The next case called attention to the mould as in some way the cause of complaint. It was that of the paymaster himself. He brought a rope somewhat moulded, and handling it awhile replaced it as unfit for use. That afternoon occurred the premonitory chill. These cases, be it observed, were confined to the wardroom, none occurring meanwhile on the berth-deck among the men.

By this time we were arrived at Beaufort, North Carolina. I caused the bilge to be purified and completely washed with sea water.

The idea of a possible connection between the acid and the mould having occurred to me, especial care was taken to keep the storerooms closed till this was done. Afterward the rooms were opened, and though, contrary to advice, several of both officers and men entered them, drawing out boxes and trunks in which to send home mementoes from the vessels we had destroyed, only one other case of the disease occurred.

For several days we lay at Beaufort, long enough at any rate to allow



a new generation of gas, and unmindful of past experience, or not viewing the matter in a serious light, under the disappointment of unfortunate orders, no precaution was taken to keep the storerooms properly aired.

The first reminder of neglect occurred upon our arrival at Hampton Roads, when, during the process of pumping out the bilge, I visited the storerooms and found everything covered with light mould as before.

In less than twelve hours, though never before a subject of such disease, even amid unusual exposure, I was seized with chill.

The rooms after this were kept open, and a strong solution of nitrate of lead poured daily into the bilge. (Apropos to this subject might be called to mind the generally received idea that this salt counteracts only the fetid odour of sulphuretted hydrogen without neutralizing its toxical properties, an impression at least not proven).

At this time occurred the only two cases recorded on the journal, among the crew, and one of these seemed singularly enough traceable to a visit to the wardroom hold.

Two months afterward, it being the month of July, and we in James River, above Bermuda Hundred, the same phenomena were repeated; but as the nature of the locality might of itself be supposed a sufficient cause, it would be scarcely necessary to give cases in detail; yet it was before the season for intermittent, and the diseases following exposure were of a more asthenic type, malarious, but tending to remittent and typhoid.

Eight cases occurred in one week. Having at this time supervision of the Medical Department of the James River fleet, I instituted inquiries with regard to all diseases of this nature; but though nothing contradictory could be gathered, nothing of additional interest was obtained.

Cases were isolated and ambiguous, and so unreliable in a locality noted for its miasm, that the inquiry was abandoned. Now whether other circumstances may have conspired to produce the effect, or whether they may throughout have been ascribable to some totally different cause, it is impossible to say; nor yet does it by any means follow that the cause of miasmatic disease always and everywhere depends on the *same* poison. Certain it is, however, the phenomena described struck me with peculiar force.

It may be supposed strange, that no other person should have recorded such a coincidence on board ship, but this ship being known as a double-ender, was of entirely new build and class. It is not often that store-rooms are placed in such relation to the hold and bilge, though an everyday occurrence to find their contents covered with mould. It is not often that mould thus formed comes so peculiarly into contact with sulphuretted hydrogen, and it is far less often that cause and effect in disease come so completely under observation.

Here, then, excluding ambiguous cases, were seven occurring under unusual circumstances, commencing at sea.

By the conformation of the ship, the growth of mould was exceedingly



common and of rapid growth. Officers and men were repeatedly exposed to its influence while in port, and with impunity, so long as the hydrosulphuric acid lay undisturbed in the bilge. Ordinary continued exposure to the gas itself, even for days, produced no effects; yet exposure to the two combined, was followed by disease. Of course other considerations do enter into the circumstances detailed, such as the long confinement of air, perhaps in itself poisonous, contents of storerooms, the susceptibilities of the men, etc., not possible to discuss at length in this paper. It may, however, be proper to state, in regard to the contents of the storerooms, that they were entirely different from each other; one containing clothing only, the other sealed bottles, and two or three officers' trunks.

Subsequent inquiries, concerning two or three other ships, has corroborated somewhat the idea here advanced, and a careful recollection and reference to experience on others of different class, tend in no way to controvert the phenomena described. I have, therefore, with apology for their incompleteness, and in apparent contradiction of what is probably the latest theory (I mean that so ably upheld by Dr. Ferguson, and approved by Dr. Bennett), ventured to present them as they are.

There are two other diseases, which being perhaps unusual in practice on shore, may be worthy a brief reference.

One an inflammatory disease of the tongue, the other peculiar to iron-clads, and termed, for want of a better name, "iron-clad fever."

A third, the "spotted fever" of late discussions, might claim a place from its comparative frequency, but would of itself demand a volume; while its phases thus far observed must be too familiar to bear repetition.

To the affection of the tongue referred to, my attention was called during the first year of the war, on board ship, then lying at the recaptured port of Norfolk, Va. Two or three cases only, however, in that year, were recorded, but during the summer of '64 they were comparatively frequent. The affection was diagnosed and treated as ordinary glossitis, arising probably from some irritating substance in food or drink, but later observation revealed a few unusual, and (because invariable) remarkable deviations from the ordinary course of that disease.

From a list of sixty cases, the following general symptoms were deduced as characteristic:—

A slight febrile movement was the initiatory symptom, with lassitude, headache, and frequently an indefinite sense of impending evil. Several cases were preceded by diarrhœa.

After a period varying from twelve to twenty-four hours, the tongue became coated, swollen, and exceedingly tender, soon the fungiform papillæ became peculiarly distinct and prominent, and in a few hours the circumvallatæ had the appearance of ulcers, covered with a thin, reddish film.



*Eucalyptus Globulus*.—The result of extensive administration of this article in intermittent fever has hardly corroborated the promise of early experience; but it is interesting to find that its alleged influence on malaria has received some substantial confirmation. Dr. Cosson recently announced that its effect in Algeria had been very marked. Since the growth of plantations of this tree around the lake of Fezzara, the malaria which formerly was intense has almost disappeared.

The village of Ain Mokra, according to Captain Ney, furnishes an equally striking instance. The station was formerly so unhealthy that it was necessary to change the French garrison every five days on account of the number of men attacked. Fever has, however, become much more rare since plantations of *Eucalyptus globulus* have been made on the shores of the lake and the sides of the railway, which include altogether 60,000 trees. A writer in the *Temps* mentions a still more singular effect—namely, that parasites (phylloxera, etc.) disappear from vines growing near the eucalyptus. The experiment, made during several years and in several vineyards, had been uniform in its result.

It is interesting, in connection with these facts, to observe that the leaves of this plant contain an ethereal oil, of which even half-dried leaves contain 6 per cent., and that this oil, according to Gimbert, is a very powerful antiseptic. It will preserve blood and pus as long as carbolic acid (five months and more), and far longer than oil of turpentine. It prevents also the appearance of fungi or vibrios. These observations have received independent confirmation from Binz, in Germany.—*Lancet*, July 3, 1875.



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*Boston Med. and Surg. Journ.*, March 19, 1874.



from New York Letter in  
Phelan Pub. Ledger 7/16/79.







Steamers Niagara and City of Merida, from Havana, are discharging cargoes at quarantine, but their passengers have been allowed to come to the city. The vessels are detained there from the fact that each has a sick seaman, supposed to be down with yellow fever.



newspaper  
official letter of the 8th inst.

Yours, respectfully,

WM. H. MCFADDEN, C. E. W. D.

On motion, of Mr. King, the request was  
granted. Adjourned.

*Destructive Fire—Narrow Escapes—Acci-*



the way of ... tions by ...  
this is their peculiar season. What has be-  
come of them? They have not gone West,  
for that region, rich in the means for preda-  
tory wayfarers who live on the road, says  
little or nothing of "tramp" troubles this  
summer. Have "tramps," after all, a whole-  
some respect for the law that sets them to  
hard work or confines them within close  
walls in the genial summer time, when  
they long for the open air luxury of the hay-  
stack? Possibly—and possibly many of  
them have gone to work without calling in  
the rigor of the law. However it is, the  
"tramp" nuisance appears to be largely  
there is one summer plague the